EDUCATIONAL PROGRAM

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

7M015 - Teacher training in natural science subjects
(Code and classification of the direction of training)

0114
(Code in the International Standard Classification of Education)

M010 - Mathematics teacher training
(Code and classification of the educational program group)

7M01501 - Mathematics
(Code and name of the educational program)

Master
(Level of preparation)

Semey

Educational program

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Master
(Level of preparation)

Semey 2023

PREFACE

Developed

The educational program 7M01501 - Mathematics in the direction of preparation 7M015 - Teacher training 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	Signature
Head of the Academic Committee	Mukaev Zhandos	Dean of the Faculty of Natural Sciences, PhD	
Educational program manager	Sydykova Ayaulym	lecturer of the Department of physical and Mathematical Sciences and informatics	
Member of the AC	Ospanova Dinara	Head of the Department of physical and Mathematical Sciences and informatics	
Member of the AC	Zholymbaev Oraltai	associate professor of the Department of Physical and Mathematical Sciences and Informatics	
Member of the AC	Aitimova Umitzhan	Mathematics teacher of Nazarbayev Intellectual School of Physics and Mathematics in Semey	
Member of the AC	Bazhenova Gulzhanat	Math teacher of KSU Secondary School No. 25	
Member of the AC	Kuntuganova Akbota	Master s student of MMT-201 group	
Member of the AC	Zhumanbekova Dana	Master s student of MMT-201 group	

Reviewing

Full name of the reviewer	Position, place of work	Signature
Toktubaeva Gulfariza	Director of KSU Secondary School No. 49	

Reviewed
At the meeting of the Quality Assurance Commission
Natural and Mathematical of the faculty
Recommended to be for approved
by the Academic Council of the University
Record No 4.1   "04" April 2023 y.
Chairman of the Commission Zheldybaeva B.

Approved at the meeting of the Academic Council of the University Protocol No. 8 "25" April 2023.

Approved
at the meeting of the Academic Council of the University
Protocol № 1 "01" of September 2023
Chairman of the Academic Council of the University Orynbekov D.R.

Content

1.Introduction

1.1.General data

The educational program "7M01501-Mathematics" implemented by the Department of Physical and Mathematical Sciences and Computer Science of the NAO "Shakarim University of Semey", developed taking into account the needs of the regional labor market, the requirements of regulatory documents of the Ministry of Science and Higher Education 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 "7M01501-Mathematics".

The educational program regulates the goals, expected results, content, conditions and technologies for the implementation of the educational process, assessment of the quality of graduate training in this area of training and contains characteristics of the program and areas of professional activity of the graduate, learning outcomes and acquired competencies, the policy of evaluating learning outcomes, the organization of the educational process that ensures the quality of training of students, description of the modules that make up the educational program. program, methodological materials, ensuring the implementation of appropriate educational technologies.

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 years

2.PASSPORT OF THE EDUCATIONAL PROGRAM

2.1.EP purpose	Training of competitive specialists with innovative approaches, research skills for the implementation of scientific, pedagogical, professional and practical activities in higher education institutions, educational authorities, educational institutions, research educational institutions.
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 - Teacher training in natural science subjects
Code in the International Standard Classification of Education	0114
Code and classification of the educational program group	M010 - Mathematics teacher training
Code and name of the educational program	7M01501 - Mathematics
2.3.Qualification characteristics of the graduate	
Degree awarded / qualification	Master of Pedagogical Sciences under the educational program 7M01501 Mathematics
Name of the profession / list of positions of a specialist	- Math teacher; - University Teacher - Junior Researcher
OQF qualification level (industry qualification framework)	7
Area of professional activity	Higher educational institutions, research institutes, research centers, design, technological and constructive organizations, management bodies, educational institutions (pedagogical schools, gymnasiums, lyceums, colleges, special schools of mathematical profile), industrial production, etc.
Object of professional activity	- research institutes of mathematics and mechanics, computer science and other organizations of natural and technical profile; - higher educational institutions of state and non-state ownership; - public administration bodies in the field of education and natural sciences; - organizations of various forms of ownership that use mathematical methods in their work
Types of professional activity	- pedagogical; - research and development; - administrative and managerial; - expert advisory
Graduate Model	Mastered competencies expressed in the achieved learning outcomes Solves problems arising in the course of research activities and requiring in-depth professional knowledge; selects the necessary research methods, modifies existing and develops new methods based on the tasks of a specific study; analyzes and comprehends the realities of modern theory and practice based on the history and philosophy of science, methodology of natural science, socio-humanitarian and technical knowledge

	Presents scientific material in a foreign language; reads, translates original literature on the specialty with subsequent analysis of interpretations and evaluation of extracted information; conducts business correspondence in a foreign language of professional activity.
	Possesses information about the current state of psychological theory and practice to the extent optimal for use in subsequent professional activity; demonstrates knowledge of the main aspects of management psychology; the need to comprehend their own prospects for managerial growth.
	Has the skills to use modern technology; has the skills to acquire new knowledge necessary for everyday professional teaching and continuing education.
	Knows the idea of how the main methodological ideas arose and developed, how individual theories of teaching mathematics were historically formed; to determine the role and place of mathematics methodology in the history of civilization development.
	Must be able to analytically approach the solution of tasks and be able to present their own new scientific results in the form of strictly substantiated statements; be able to formalize research results in the form of articles, reports, etc.
	Knows the history of the development of a specific scientific problem, its role and place in the studied scientific direction, works with specific software products, specific resources on the network Internet. He is able to work with scientific information, has the skills of academic writing (abstracting, annotating, writing a scientific article, project) and presentation of the topic, presents his own new scientific results in the form of strictly substantiated statements and draws up research results in the form of articles, reports, etc.
	Professional competencies
	Possess the skills of acquiring new knowledge; the ability to apply the acquired knowledge during pedagogical practice, to solve practical problems; possession of basic information of algebra, geometry and logic, mathematical, real and complex analysis; understanding of the principles of scientific research in the field of algebra, geometry and logic; demonstrates basic knowledge in the field of methods of teaching mathematical analysis in higher education; demonstrates basic knowledge in the field of methods of teaching algebra and number theory at the University.
	Be able to work in a team, correctly defend your point of view, offer new solutions; strive for professional and personal growth; willingness to use the main directions of modernization of modern school mathematics education; develop an idea of the main ideas and methods of teaching mathematics, and communication with the surrounding reality; form psychological, educational and social readiness to work as a mathematics teacher in the modern general education environment.
	Possess the skills to acquire new knowledge; work in

| | a team, offer new solutions; have an idea of the place and role of mathematics in the modern world; form personality qualities that provide deep scientific, theoretical and methodological knowledge of the basics of physical, mathematical, psychological, pedagogical and special theoretical sciences that contribute to the successful assimilation of applied disciplines of the specialty; |
| | Be able to correctly formulate the goals and objectives of scientific research, the concept of scientific search; make a plan of research work on individual sections of the master`s thesis, plan the resources necessary to perform the work, evaluate the results of their own work; be able to extract useful scientific and technical information from electronic libraries, abstract journals, the Internet; be able to present their own new scientific results in the form of strictly substantiated statements. |

Personal qualities of the graduate
Ability to solve complex problems;
Critical thinking;
Creativity;
Ingenuity;
Having experience in implementing your ideas;
Intellectual qualities;
The ability to translate the acquired knowledge into material and activity forms;
Efficiency-practicality (the ability to optimally use professional knowledge, work on modern office equipment);
The ability to lead;
Ability to make contact quickly;
Openness to new experiences;
Ability to observe, analyze specific life situations;
The ability to self-improvement, self-actualization and self-realization.

3.Modules and content of the educational program

Sociolinguistic and scientific-pedagogical activity

Foreign language (professional)

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	29645 (3011755)
Course	1
Term	1
Credits count	3
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	20hours
Independent work of the student	40hours
Total	90hours
Knowledge control form	Examination

Short description of discipline
Mastery of general cultural, professional and special competencies for the implementation of professional activities, involving teaching free reading of original literature of the relevant branch of knowledge in a foreign language; development of oral communication skills in monological and dialogical form in the specialty; development of written scientific communication skills on topics related to the scientific work of a graduate student, as well as familiarization with the forms and types of international cooperation in the scientific field.

Purpose of studying of the discipline
The purpose of studying the discipline "Foreign language (professional)" in the master`s degree program is the systematic deepening of communicative competence within the framework of international standards of foreign language education on the basis of further development of skills and abilities of active language proficiency in the professional activity of the future master.

Learning Outcomes
ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.

Prerequisites
Bachelor

Postrequisites
Final examination

History and philosophy of science

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	29644 (3011754)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is aimed at studying the culture of scientific thinking, forms analytical capabilities and research skills, provides theoretical and practical knowledge necessary for a future scientist. Explores the historical evolution of the sciences and the philosophical perspectives they form. The origins of modern science, its social and institutional connections are described. General philosophical issues related to thought experiments, confirmation and refutation of theories, the origin and application of quantitative and high-quality research methods are considered.

Purpose of studying of the discipline
the formation of an interdisciplinary worldview among undergraduates, based on a deep understanding of the history and philosophy (theory) of scientific thinking, as part of a universal culture.

Learning Outcomes
ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.

Prerequisites
Bachelor

Postrequisites
Final examination

Tertiary education

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	29646 (3011756)

Course	1
Term	1
Credits count	3
Lections	15hours
Practical and seminar classes	15hours
Independent work of a student under the guidance of a teacher	20hours
Independent work of the student	40hours
Total	90hours
Knowledge control form	Examination

Short description of discipline

The course is aimed at studying the main directions, principles and patterns of higher education. During the course of the course, the basic concepts of modern pedagogy, concepts and theories of teaching and upbringing, didactics of higher education will be considered. The master`s student will master the skills of designing the organization of the educational process, techniques of individual and group reflection, will be able to correctly formulate pedagogical goals, apply educational technologies in the educational process. in the process, to design work programs of disciplines.

Purpose of studying of the discipline

The purpose of mastering the discipline is to master the system of knowledge about higher education, its content, structure, principles of educational process management and mastering modern technologies in the field of management and organization of the educational process

Learning Outcomes

ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.

Prerequisites

Bachelor

Postrequisites

Final examination

Psychology of management

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	29647 (3011757)
Course	1
Term	1
Credits count	3
Lections	15hours
Practical and seminar classes	15hours
Independent work of a student under the guidance of a teacher	20hours
Independent work of the student	40hours
Total	90hours
Knowledge control form	Examination

Short description of discipline

The content of the course is aimed at mastering the approaches and directions of management psychology, psychological laws of management, features of planning and solving management problems. Students will get acquainted with the psychological methods of resolving conflict situations, master the ways of motivating work, the methods of using effective management styles. Skills will be formed to analyze the psychological causes underlying the decline in the effectiveness of the management process.

Purpose of studying of the discipline

The purpose of the discipline "Psychology of Management" is the formation of scientifically based ideas about the system of mental phenomena, psychological variables of behavior and conscious human activity in modern conditions and allows undergraduates to form skills of applying the acquired psychological knowledge in educational activities

Learning Outcomes

ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.

Prerequisites

Bachelor

Postrequisites

Final examination

Pedagogical practice

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	29659 (3011726)
Course	2
Term	1
Credits count	6
Pedagogical practics	180hours
Total	180hours
Knowledge control form	Total mark on practice

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON7 Possess advanced experience of mathematics teachers in the organization of educational, research activities of schoolchildren and students.
Prerequisites
Basic and profile disciplines of the EP
Postrequisites
Final examination

Professional and didactic level of training

Commutative algebra

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	29637 (3011730)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Commutative algebra has become one of the fundamental tools of algebraic geometry. The central place is occupied by the concept of a prime ideal and a commutative ring. It serves at the same time as an abstraction of prime numbers in arithmetic and points in algebraic geometry. The method adopted in geometry to analyze a condition in the vicinity of a certain point also has an algebraic analogue: this is an important process of localization of a ring with respect to a prime ideal.
Purpose of studying of the discipline
Mastering the basic provisions of classical sections of mathematical science, basic ideas and methods of mathematics, a system of basic mathematical structures and an axiomatic method based on the formed system of knowledge, skills and abilities in the field of commutative algebra.
Learning Outcomes
ON3 Defend your point of view, demonstrating analytical and logical thinking skills, relying on facts, theories and scientific results of mathematics, analyze the effectiveness of their functioning of applied tasks.
Prerequisites
Basic and profile disciplines of the EP
Postrequisites
Pedagogical practice

Mathematical methods of processing the results of a pedagogical experiment

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	29642 (3011751)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON2 To summarize the results of experimental research and analytical work in the form of a masters thesis, an article, a report, an analytical note, etc.
ON6 To identify the scientific essence of problems in the field of fundamental disciplines in the specialty for solving theoretical and scientific-practical mathematical problems.
Prerequisites
Basic and profile disciplines of the EP
Postrequisites
Final examination

Methods of teaching algebra and the theory

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	29643 (3011752)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes

ON3 Defend your point of view, demonstrating analytical and logical thinking skills, relying on facts, theories and scientific results of mathematics, analyze the effectiveness of their functioning of applied tasks.

Prerequisites
Basic and profile disciplines of the EP
Postrequisites
Pedagogical practice

Modern problems of algebra

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	29648 (3011758)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes

ON3 Defend your point of view, demonstrating analytical and logical thinking skills, relying on facts, theories and scientific results of mathematics, analyze the effectiveness of their functioning of applied tasks.

Prerequisites
Basic and profile disciplines of the EP
Postrequisites
The research work of a student, including an internship and the implementation of a masters thesis III

Fundamental aspects of algebra, geometry and logic

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	29650 (3011731)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes

ON3 Defend your point of view, demonstrating analytical and logical thinking skills, relying on facts, theories and scientific results of

mathematics, analyze the effectiveness of their functioning of applied tasks.
Prerequisites
Bachelor
Postrequisites
Final examination

Analytical functions

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30441 (3023046)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON5 To investigate problems in various fields of mathematics, to apply information technologies for the analysis of comprehension, processing and presentation of the results of their own research.
Prerequisites
Bachelor
Postrequisites
Final examination

Computer modeling of mathematical problems

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	29670 (3011759)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON8 Apply digital educational resources and computer technologies in teaching mathematics, theoretical analysis of the results of observations and experiments
Prerequisites
Basic and profile disciplines of the EP
Postrequisites
Final examination

Culture and Ethics of Academic writingy

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	29672 (3011762)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours

Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON3 Defend your point of view, demonstrating analytical and logical thinking skills, relying on facts, theories and scientific results of mathematics, analyze the effectiveness of their functioning of applied tasks.

Prerequisites
Basic and profile disciplines of the EP
Postrequisites
Final examination

Methodology for creating variable courses in mathematics

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	29671 (3011761)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON3 Defend your point of view, demonstrating analytical and logical thinking skills, relying on facts, theories and scientific results of mathematics, analyze the effectiveness of their functioning of applied tasks.

Prerequisites
Basic and profile disciplines of the EP
Postrequisites
Final examination

Features of multilingual learning math

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	29662 (3011729)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON4 To argue their position in Kazakh, Russian and foreign languages, to use a professional foreign language when discussing topical topics of mathematics, in writing scientific articles.

Prerequisites
Basic and profile disciplines of the EP
Postrequisites
Final examination

Application of ICT in teaching mathematics

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	29661 (3011728)
Course	2
Term	1

Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON8 Apply digital educational resources and computer technologies in teaching mathematics, theoretical analysis of the results of observations and experiments
Prerequisites
Basic and profile disciplines of the EP
Postrequisites
Final examination

Practice research

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	29673 (3011744)
Course	2
Term	2
Credits count	13
Working practice	390hours
Total	390hours
Knowledge control form	Total mark on practice

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON2 To summarize the results of experimental research and analytical work in the form of a masters thesis, an article, a report, an analytical note, etc.
Prerequisites
Basic and profile disciplines of the EP
Postrequisites
Final examination

Methodology of scientific research

External evaluation of educational achievement of pupils in mathematics (PISA, SAT,SET, UNT)

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	29639 (3011736)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The evaluation of the results of educational achievements in mathematics performs several important functions: the feedback function, which helps to obtain an objective picture of the data, in order to manage the quality of education; the orientation function of the educational process for planning further results through the content of concrete examples and internal evaluation criteria. In this course, we consider different types of external assessments and solve specific tasks.
Purpose of studying of the discipline
To create a system of different forms of evaluation of educational achievements.
Learning Outcomes
ON6 To identify the scientific essence of problems in the field of fundamental disciplines in the specialty for solving theoretical and scientific-practical mathematical problems.
Prerequisites
Basic and profile disciplines of the EP
Postrequisites

Pedagogical practice

Methodology of pedagogical research

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	29649 (3011760)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON2 To summarize the results of experimental research and analytical work in the form of a masters thesis, an article, a report, an analytical note, etc.
Prerequisites
Basic and profile disciplines of the EP
Postrequisites
The research work of a student, including an internship and the implementation of a masters thesis III

Methods of teaching updated content in secondary education

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	29638 (3011735)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The updated content of education improves the pedagogical skills of teachers in an effort to give new knowledge and practical application. The main task is to involve each student in the process of cognition, to direct individual qualities in the right direction and to give direction in the independent extraction of new knowledge, to give a foundation for critical thinking, versatile development and functional literacy.
Purpose of studying of the discipline
To ensure the formation of professional competence of mathematics teachers in the updated content of education
Learning Outcomes
ON5 To investigate problems in various fields of mathematics, to apply information technologies for the analysis of comprehension, processing and presentation of the results of their own research.
ON7 Possess advanced experience of mathematics teachers in the organization of educational, research activities of schoolchildren and students.
Prerequisites
Basic and profile disciplines of the EP
Postrequisites
Pedagogical practice

Statistical modeling and analysis

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	29641 (3011738)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours

Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Course subject, history and prospects of development of methods of mathematical modeling. Relevance and importance of problems of simulation and statistical modeling. The concept of a complex system. Performance indicators of complex systems. Types of systems modeling. Classification of mathematical models. Discrete continuous models, deterministic and stochastic models. Simulation modeling. Monte Carlo method and its applications.

Purpose of studying of the discipline
To acquire profound knowledge in the field of statistical modeling and the analysis

Learning Outcomes
ON5 To investigate problems in various fields of mathematics, to apply information technologies for the analysis of comprehension, processing and presentation of the results of their own research.

Prerequisites
Bachelor

Postrequisites
Pedagogical practice

Effective methods of solving tasks UNT

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	29640 (3011737)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
To increase the level of knowledge and skills in the field of this discipline. Various methods and techniques used in solving mathematical tests. The comparison of these methods, for simplicity and time-consuming. Effective methods and techniques for quality training for UNT in mathematics.

Purpose of studying of the discipline

Learning Outcomes
ON2 To summarize the results of experimental research and analytical work in the form of a masters thesis, an article, a report, an analytical note, etc.
ON6 To identify the scientific essence of problems in the field of fundamental disciplines in the specialty for solving theoretical and scientific-practical mathematical problems.
ON7 Possess advanced experience of mathematics teachers in the organization of educational, research activities of schoolchildren and students.

Prerequisites
School course Bachelor

Postrequisites
Pedagogical practice

Building tasks in the geometry course

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	29657 (3011753)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes

ON2 To summarize the results of experimental research and analytical work in the form of a masters thesis, an article, a report, an analytical note, etc.

ON6 To identify the scientific essence of problems in the field of fundamental disciplines in the specialty for solving theoretical and scientific-practical mathematical problems.

Prerequisites
School course
Postrequisites
Practice research

Research activity of students in mathematics

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	29656 (3011750)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON2 To summarize the results of experimental research and analytical work in the form of a masters thesis, an article, a report, an analytical note, etc.
Prerequisites
Basic and profile disciplines of the EP
Postrequisites
Final examination

Current problems in the teaching of mathematical analysis at the University

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	29652 (3011733)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON5 To investigate problems in various fields of mathematics, to apply information technologies for the analysis of comprehension, processing and presentation of the results of their own research.
Prerequisites
Bachelor
Postrequisites
Practice research

Additional chapters of mathematical analysis at the University

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	29653 (3011734)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours

Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON6 To identify the scientific essence of problems in the field of fundamental disciplines in the specialty for solving theoretical and scientific-practical mathematical problems.
Prerequisites
Bachelor
Postrequisites
Final examination

Methods of teaching mathematical analysis at the University

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	29651 (3011732)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON5 To investigate problems in various fields of mathematics, to apply information technologies for the analysis of comprehension, processing and presentation of the results of their own research.
ON6 To identify the scientific essence of problems in the field of fundamental disciplines in the specialty for solving theoretical and scientific-practical mathematical problems.
Prerequisites
Bachelor
Postrequisites
Pedagogical practice

The development methodology of elective courses in mathematics in specialised schools

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	29654 (3011742)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON2 To summarize the results of experimental research and analytical work in the form of a masters thesis, an article, a report, an analytical note, etc.
ON5 To investigate problems in various fields of mathematics, to apply information technologies for the analysis of comprehension, processing and presentation of the results of their own research.
ON6 To identify the scientific essence of problems in the field of fundamental disciplines in the specialty for solving theoretical and scientific-practical mathematical problems.
Prerequisites
Basic and profile disciplines of the EP Bachelor
Postrequisites
Final examination Pedagogical practice

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

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	29658 (3011763)
Course	1
Term	2
Credits count	11
The research work	330hours
Total	330hours
Knowledge control form	Total mark on practice

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON2 To summarize the results of experimental research and analytical work in the form of a masters thesis, an article, a report, an analytical note, etc.

Prerequisites
Masters degree course

Postrequisites
The research work of a student, including an internship and the implementation of a masters thesis II

Current trends update content and technology education

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	29655 (3011743)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON5 To investigate problems in various fields of mathematics, to apply information technologies for the analysis of comprehension, processing and presentation of the results of their own research.
ON7 Possess advanced experience of mathematics teachers in the organization of educational, research activities of schoolchildren and students.

Prerequisites
Bachelor

Postrequisites
Final examination

Organization of project activities in mathematics

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30442 (3023047)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON6 To identify the scientific essence of problems in the field of fundamental disciplines in the specialty for solving theoretical and

scientific-practical mathematical problems.
Prerequisites
Basic and profile disciplines of the EP
Postrequisites
Final examination

Laws of probability and methods of statistical data processing

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	29664 (3011740)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON5 To investigate problems in various fields of mathematics, to apply information technologies for the analysis of comprehension, processing and presentation of the results of their own research.
Prerequisites
Bachelor
Postrequisites
Final examination

Methodology for teaching probability theory and mathematical statistics

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	29663 (3011739)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON5 To investigate problems in various fields of mathematics, to apply information technologies for the analysis of comprehension, processing and presentation of the results of their own research.
Prerequisites
Bachelor
Postrequisites
Final examination

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

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	29666 (3011745)
Course	2
Term	1
Credits count	4
The research work	120hours
Total	120hours
Knowledge control form	Total mark on practice

Short description of discipline

Purpose of studying of the discipline
Learning Outcomes
ON2 To summarize the results of experimental research and analytical work in the form of a masters thesis, an article, a report, an analytical note, etc.
Prerequisites
The research work of a student, including an internship and the implementation of a masters thesis I
Postrequisites
The research work of a student, including an internship and the implementation of a masters thesis III

New learning technologies in mathematics

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	29665 (3011741)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON5 To investigate problems in various fields of mathematics, to apply information technologies for the analysis of comprehension, processing and presentation of the results of their own research.
Prerequisites
School course Basic and profile disciplines of the EP
Postrequisites
Final examination

Teaching mathematics in small schools

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	29667 (3011747)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes
ON5 To investigate problems in various fields of mathematics, to apply information technologies for the analysis of comprehension, processing and presentation of the results of their own research.
Prerequisites
Basic and profile disciplines of the EP
Postrequisites
Pedagogical practice

Development and use of electronic educational publications and Internet resources for math

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	29668 (3011748)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours

Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes

ON2 To summarize the results of experimental research and analytical work in the form of a masters thesis, an article, a report, an analytical note, etc.

ON5 To investigate problems in various fields of mathematics, to apply information technologies for the analysis of comprehension, processing and presentation of the results of their own research.

ON8 Apply digital educational resources and computer technologies in teaching mathematics, theoretical analysis of the results of observations and experiments

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
Final examination

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

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	29674 (3011746)
Course	2
Term	2
Credits count	9
The research work	270hours
Total	270hours
Knowledge control form	Total mark on practice

Short description of discipline
Purpose of studying of the discipline
Learning Outcomes

ON2 To summarize the results of experimental research and analytical work in the form of a masters thesis, an article, a report, an analytical note, etc.

Prerequisites
The research work of a student, including an internship and the implementation of a masters thesis II

Postrequisites
Final examination

Final assessment

Master`s dissertation

Credits count	8

4.Summary table on the scope of the educational program
«7M01501 - Mathematics»

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
Tertiary education	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 didactic level of training										
Commutative algebra	BS/CCh	1	5	150	15	30		35	70	Examination
Mathematical methods of processing the results of a pedagogical experiment	BS/CCh	1	5	150	15	30		35	70	Examination
Methods of teaching algebra and the theory	BS/CCh	1	5	150	15	30		35	70	Examination
Modern problems of algebra	BS/CCh	1	5	150	15	30		35	70	Examination
Fundamental aspects of algebra, geometry and logic	AS/US	2	5	150	15	30		35	70	Examination
Analytical functions	AS/CCh	3	5	150	15	30		35	70	Examination
Computer modeling of mathematical problems	AS/CCh	3	5	150	15	30		35	70	Examination
Culture and Ethics of Academic writingy	AS/CCh	3	5	150	15	30		35	70	Examination
Methodology for creating variable courses in mathematics	AS/CCh	3	5	150	15	30		35	70	Examination
Features of multilingual learning math	AS/CCh	3	5	150	15	30		35	70	Examination
Application of ICT in teaching mathematics	AS/CCh	3	5	150	15	30		35	70	Examination
Practice research	AS/US	4	13	390						Total mark on practice
Methodology of scientific research										
External evaluation of educational achievement of pupils in mathematics (PISA, SAT,SET, UNT)	BS/CCh	1	5	150	15	30		35	70	Examination
Methodology of pedagogical research	BS/CCh	1	5	150	15	30		35	70	Examination
Methods of teaching updated content in secondary education	BS/CCh	1	5	150	15	30		35	70	Examination
Statistical modeling and analysis	BS/CCh	1	5	150	15	30		35	70	Examination
Effective methods of solving tasks UNT	BS/CCh	1	5	150	15	30		35	70	Examination
Building tasks in the geometry course	AS/CCh	2	5	150	15	30		35	70	Examination
Research activity of students in mathematics	AS/US	2	5	150	15	30		35	70	Examination

Current problems in the teaching of mathematical analysis at the University	AS/CCh	2	5	150	15	30		35	70	Examination
Additional chapters of mathematical analysis at the University	AS/CCh	2	5	150	15	30		35	70	Examination
Methods of teaching mathematical analysis at the University	AS/CCh	2	5	150	15	30		35	70	Examination
The development methodology of elective courses in mathematics in specialised schools	AS/CCh	2	5	150	15	30		35	70	Examination
The research work of a student, including an internship and the implementation of a masters thesis I	AS/US	2	11	330						Total mark on practice
Current trends update content and technology education	AS/CCh	2	5	150	15	30		35	70	Examination
Organization of project activities in mathematics	AS/CCh	3	5	150	15	30		35	70	Examination
Laws of probability and methods of statistical data processing	AS/CCh	3	5	150	15	30		35	70	Examination
Methodology for teaching probability theory and mathematical statistics	AS/CCh	3	5	150	15	30		35	70	Examination
The research work of a student, including an internship and the implementation of a masters thesis II	AS/US	3	4	120						Total mark on practice
New learning technologies in mathematics	AS/CCh	3	5	150	15	30		35	70	Examination
Teaching mathematics in small schools	AS/CCh	3	5	150	15	30		35	70	Examination
Development and use of electronic educational publications and Internet resources for math	AS/CCh	3	5	150	15	30		35	70	Examination
The research work of a student, including an internship and the implementation of a masters thesis III	AS/US	4	9	270						Total mark on practice
Final assessment										
Master`s dissertation		4	8	240						