NJSC SHAKARIM UNIVERSITY OF SEMEY

EDUCATIONAL PROGRAM

6B01 - Pedagogical sciences
(Code and classifcation of the feld of education)

6B015 - Teacher training in natural science subjects
(Code and classifcation of the direction of training)

0114
(Code in the International Standard Classifcation of Education)

B009 - Math teacher training
(Code and classifcation of the educational program group)

6B01501 – Mathematics
(Code and name of the educational program)

Bachelor
(Level of preparation)

Semey

Educational program

6B01 - Pedagogical sciences
(Code and classification of the field of education)

6B015 - Teacher training in natural science subjects
(Code and classification of the direction of training)

0114
(Code in the International Standard Classification of Education)

B009 - Math teacher training
(Code and classification of the educational program group)

6B01501 - Mathematics
(Code and name of the educational program)

bachelor
(Level of preparation)

Semey 2023

PREFACE

Developed

The educational program 6B01501 - Mathematics in the direction of preparation 6B015 - 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	Mukayev Zhandos	Dean of the Faculty of Natural Mathematics, PhD	
Educational program manager	Taiboldina Kalamkas	Senior lecturer	
Member of the AC	Ospanova Dinara	Head of the Department of Physical and Mathematical Sciences and Computer Science	
Member of the AC	Zholymbayev Oraltay	Associate Professor (Assistant Professor) of the Department of Physical and Mathematical Sciences and Informatics	
Member of the AC	Aytimova 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	Gafiz Zharas	Student of group M1-001	
Member of the AC	Madeniyatova Zhuldyz	Student of group M1-101	

Reviewing

Full name of the reviewer	Position, place of work	Signature
Toktubaeva Gulpariza	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, april 4, 2023 y.
Chairman of the Commission Zheldybayeva B.S.

Agreed

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

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

Department of Physical and Mathematical Sciences and Computer Science of the Faculty of Natural Mathematics of the NAO "Shakarim Semey University", provides training in the educational program 6B01501 Mathematics.The OP for the training of mathematics teachers has been operating since 1934. During the period of its existence, the OP has graduated about 4,584 math teachers.

As a result of mastering the educational program, the graduate must have the following competencies: possess natural science, social and humanitarian knowledge, know the content of the regulatory framework of the education system of the Republic of Kazakhstan, be able to plan and conduct training sessions taking into account the specifics of topics and sections of the program in accordance with the curriculum, as well as organizes a student-centered approach to the education and development of students in order to create motivation for learning.

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

1.2.Completion criteria

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

1.3.Typical study duration: 4 years

2.PASSPORT OF THE EDUCATIONAL PROGRAM

2.1.EP purpose	Preparation of highly competitive specialist of modern formation, possessing multiculturalism, communication, capable of creative and professional problem solving at a high pedagogical and scientific and practical level, prepared for work by teachers of mathematics
2.2.Map of the training profile within the educational program	
Code and classification of the field of education	6B01 - Pedagogical sciences
Code and classification of the direction of training	6B015 - Teacher training in natural science subjects
Code in the International Standard Classification of Education	0114
Code and classification of the educational program group	B009 - Math teacher training
Code and name of the educational program	6B01501 - Mathematics
2.3.Qualification characteristics of the graduate	
Degree awarded / qualification	Bachelor of Education in the educational program 6B01501 Mathematics
Name of the profession / list of positions of a specialist	Teacher. high school teacher
OQF qualification level (industry qualification framework)	6
Area of professional activity	- Math teacher - research institutions; - middle schools, and secondary professional education institutions; - State management bodies; organizations of various forms of ownership that use mathematical methods in their work; - state-owned enterprises and institutions. - Business, economy. officials in educational organizations (director of a general educational institution, deputy directors for educational work, etc .) -methodologist in educational organizations; specialist in the field of pedagogical sciences; in research institutions
Object of professional activity	- research institutions; - middle schools, and secondary professional education institutions; - state educational management bodies; organizations of various forms of ownership that use methods of teaching mathematics in their work.
Types of professional activity	- apply modern pedagogical technologies in teaching mathematics; - plan and carry out research work in the field of pedagogical sciences; - conducting scientific and pedagogical activities in general education organizations; - use of software and computer technology; - organizational and managerial support; - social and pedagogical; - educational and educational program;

	- educational and technological.
Graduate Model	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

Module 1. Fundamentals of social and humanitarian knowledge

Foreign language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26456 (3012380)
Course	1
Term	1
Credits count	5
Practical and seminar classes	45hours
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 content of the discipline «Foreign language» assumes the formation of students` intercultural and communicative competencies at B1 level. The discipline is aimed at mastering the knowledge, skills and abilities that allow using a foreign language in interpersonal communication and professional activity. All types of speech activity are taught, such as reading, writing, listening and production of texts of level complexity with a certain degree of grammatical and lexical correctness.

Purpose of studying of the discipline

Formation of intercultural and communicative competence of students in the process of foreign language education at a sufficient level (A2, pan-European competence) and the level of basic sufficiency (B1, pan-European competence). Depending on the level of training, the student at the time of completion of the course reaches the B1 level of the pan-European competence if the language level of the student at the start is higher than the A2 level of the pan-European competence.

Learning Outcomes

ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites

School course

Postrequisites

Foreign language

Kazakh language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26457 (3012382)
Course	1
Term	1
Credits count	5
Practical and seminar classes	45hours
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 deepening the acquired knowledge of students in the framework of the school curriculum, as well as the use of language and speech means based on a full understanding of vocabulary and grammatical system of knowledge; the formation of socio-humanitarian worldview of students within the framework of the national idea of spiritual revival; free expression of mobile thought as a means of speech communication and in the process of communication; awareness of the national culture of the people, the ability to distinguish features of national cognition.

Purpose of studying of the discipline

Forms through phraseological units the recognition of national culture, its meaning as a linguistic unit related to spiritual culture; skills of identifying facts of national and cultural significance in the formation of Kazakh phraseology.

Learning Outcomes

ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites

School course

Postrequisites

Kazakh language

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

Discipline cycle	General educational disciplines

Discipline component	Compulsory component
SubjectID	26459 (3012444)
Course	1
Term	1
Credits count	8
Lections	30hours
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	55hours
Independent work of the student	110hours
Total	240hours
Knowledge control form	Examination

Short description of discipline

The module of socio-political knowledge involves the study of four scientific disciplines – sociology, political science, cultural studies, psychology, each of which has its own subject, terminology and research methods. Interactions between these scientific disciplines are carried out on the basis of the principles of information complementarity; integrativity; methodological integrity of research approaches of these disciplines; generality of the methodology of learning, result-oriented; unified system representation of the typology of learning outcomes as formed abilities.

Purpose of studying of the discipline

Formation of social and humanitarian worldview of students in the context of solving the problems of modernization of public consciousness, defined by the state program "Looking into the Future: Modernization of Public Consciousness".

Learning Outcomes

ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites

School course

Postrequisites

Philosophy

Russian language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26458 (3012383)
Course	1
Term	1
Credits count	5
Practical and seminar classes	45hours
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 intended for the development of the language personality of the student, who is able to carry out cognitive and communicative activities in Russian in the areas of interpersonal, social, professional, intercultural communication; for teaching students practical mastery of the Russian language in various areas of communication and various situations, mastering the specifics of functional semantic types and genres of functional styles of speech, enriching the vocabulary with special vocabulary, forming and improving the skills of monologue and dialogic speech.

Purpose of studying of the discipline

The purpose of the program is to form the socio-humanitarian worldview of students in the context of the national idea of spiritual modernization, involving the development on the basis of national consciousness and cultural code of the qualities of internationalism, tolerant attitude to world cultures and languages as translators of world-class knowledge, advanced modern technologies, the use and transfer of which can ensure the modernization of the country and personal career growth of future specialists.

Learning Outcomes

ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites

School course

Postrequisites

Russian language

Physical Culture

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26330 (3012367)
Course	1
Term	1

Credits count	2
Practical and seminar classes	60hours
Total	60hours
Knowledge control form	Differentiated attestation

Short description of discipline
It provides for the joint cooperation of a teacher and a student in the process of physical education throughout the training in the context of the requirements for the level of mastering the discipline, preparing students for participation in mass sports competitions; forms motivational and value attitudes towards physical culture and the need for systematic physical exercises and sports; gives basic knowledge about the use of physical culture and sports in the development of vital physical qualities.

Purpose of studying of the discipline
The purpose of the program is the formation of social and personal competencies of students and the ability to purposefully use the means and methods of physical culture, ensuring the preservation, strengthening of health to prepare for professional activities; to the persistent transfer of physical exertion, neuropsychic stress and adverse factors in future work.

Learning Outcomes
ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites
School course

Postrequisites
Physical Culture

Kazakh language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26453 (3012384)
Course	1
Term	2
Credits count	5
Practical and seminar classes	45hours
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 expanding language literacy, free communication with the environment and mental and ideological skills of the student, understanding the role of language in the process of mastering world-class knowledge through the formation of a future specialist`s worldview based on national consciousness and cultural code, improving the knowledge of the state language by future specialists, increasing the scope of use of the Kazakh language by specialists.

Purpose of studying of the discipline
Ensuring high-quality mastery of the Kazakh language as a means of social, intercultural, professional communication through the formation of communicative competencies at all levels of language use.

Learning Outcomes
ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites
Kazakh language

Postrequisites
Basic and profile disciplines of the EP

Foreign language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26454 (3012381)
Course	1
Term	2
Credits count	5
Practical and seminar classes	45hours
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 content of the discipline «Foreign language» assumes the formation of students` linguo-cultural, socio-cultural, cognitive and communicative competencies at B2 level.The discipline is aimed at deep and extended study of productive and receptive language material. As a result, the student must be able to understand all types of speech activity in accordance with the requirements of B2 level and master the subject content of the discipline and speech.

Purpose of studying of the discipline
Formation of linguo- culturological, socio- cultural, cognitive and communicative competence of students in the process of foreign language education at the B2 level, pan-European competence. Depending on the level of training, the student at the time of completing the course reaches the level B2 of the common European competence, if the language level of the student at the start is higher than the level B1 of the common European competence.

Learning Outcomes
ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites
Foreign language

Postrequisites
Basic and profile disciplines of the EP

Bases of economics, law and ecological knowledge

Discipline cycle	General educational disciplines
Discipline component	University component
SubjectID	26451 (3012445)
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
The integrated discipline includes the main issues and principles in the field of fundamentals of law and anti- corruption culture, economics, entrepreneurship and leadership, ecology and life safety. Features of the use of regulatory legal acts, the ability to use the business, ethical, social, economic, entrepreneurial and environmental standards of society. Specifics of environmental-legal, economic, entrepreneurial relations, leadership qualities and principles of combating corruption.

Purpose of studying of the discipline
It consists in studying the basic patterns of the functioning of living organisms, the biosphere as a whole and the mechanisms of their sustainable development under the conditions of anthropogenic impact and emergency situations; in understanding the concept of corruption, the legitimacy of the fight against it, the content of the state penal policy; in the formation of students` basic fundamental stable knowledge on the basics of economic theory, in instilling the skills and abilities of economic thinking; in introducing students to the theory and practice of entrepreneurship, to the basics of creating their own business; in the formation of theoretical knowledge and practical skills for the development and improvement of leadership qualities.

Learning Outcomes
ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites
School course

Postrequisites
Basic and profile disciplines of the EP

Russian language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26452 (3012385)
Course	1
Term	2
Credits count	5
Practical and seminar classes	45hours
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 intended for the development of the language personality of the student, who is able to carry out cognitive and communicative activities in Russian in the areas of interpersonal, social, professional, intercultural communication; to teach the scientific style of speech as a language of specialty, the creation of secondary texts, the formation of skills for the production of oral and written speech in accordance with the communicative goal and the professional sphere of communication, instilling the skills of speech etiquette, business rhetoric.

Purpose of studying of the discipline
The purpose of the program is to form the socio-humanitarian worldview of students in the context of the national idea of spiritual modernization, involving the development on the basis of national consciousness and cultural code of the qualities of internationalism,

tolerant attitude to world cultures and languages as translators of world-class knowledge, advanced modern technologies, the use and transfer of which can ensure the modernization of the country and personal career growth of future specialists.

Learning Outcomes

ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites

Russian language

Postrequisites

Basic and profile disciplines of the EP

Physical Culture

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26455 (3012368)
Course	1
Term	2
Credits count	2
Practical and seminar classes	60hours
Total	60hours
Knowledge control form	Differentiated attestation

Short description of discipline

It provides for the joint cooperation of a teacher and a student in the process of physical education throughout the training in the context of the requirements for the level of mastering the discipline, the ability to exercise control and self-control in the process of classes, gaining knowledge on health promotion, hardening and increasing the body`s resistance to the effects of adverse factors of labor activity, mastering methods of selection of physical exercises and sports.

Purpose of studying of the discipline

The purpose of the program is the formation of social and personal competencies of students and the ability to purposefully use the means and methods of physical culture, ensuring the preservation, strengthening of health to prepare for professional activities; to the persistent transfer of physical exertion, neuropsychic stress and adverse factors in future work.

Learning Outcomes

ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites

Physical Culture

Postrequisites

Physical Culture

History of Kazakhstan

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26462 (3012441)
Course	2
Term	1
Credits count	5
Lections	30hours
Practical and seminar classes	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Qualification examination

Short description of discipline

The main stages of the history of Kazakhstan are studied with: nomadic statehood, Turkic civilization, the era of colonialism, the Soviet period, independence. The driving forces, trends, patterns of historical development are analyzed; problems: ethnogenesis of the Kazakh people, the formation of statehood, national liberation movements, demographic development. The skills of analyzing historical events and facts, working with historical literature are being formed.

Purpose of studying of the discipline

The purpose of the discipline is to provide objective knowledge about the main stages of the development of the history of Kazakhstan from ancient times to the present.

Learning Outcomes

ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites

School course

Postrequisites

Philosophy

Physical Culture

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26461 (3012369)
Course	2
Term	1
Credits count	2
Practical and seminar classes	60hours
Total	60hours
Knowledge control form	Differentiated attestation

Short description of discipline
Provides for the joint cooperation of the teacher and the student in the process of physical education throughout the training in the context of the requirements for the level of mastering the discipline; increasing the level of physical fitness and developing physical qualities; mastering the technique of sports; education of discipline, collectivism, comradely mutual assistance; education of mental stability, development and improvement of basic motor qualities - endurance, strength, speed, dexterity, flexibility.

Purpose of studying of the discipline
The purpose of the program is the formation of social and personal competencies of students and the ability to purposefully use the means and methods of physical culture, ensuring the preservation, strengthening of health to prepare for professional activities; to the persistent transfer of physical exertion, neuropsychic stress and adverse factors in future work.

Learning Outcomes
ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites
Physical Culture

Postrequisites
Physical Culture

Information and communication technology

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26479 (3012446)
Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
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 mastering the conceptual foundations of the architecture of computer systems, operating systems and networks by students; formation of the ability to critically understand the role and signifcance of modern information and communication technologies in the era of digital globalization, new "digital" thinking, knowledge about the concepts of developing network and web applications, skills in using modern information and communication technologies in various felds of professional activity, scientifc and practical work, for self-educational and other purposes.

Purpose of studying of the discipline
Formation of the ability to critically evaluate and analyze processes, methods of searching, storing and processing information, methods of collecting and transmitting information through digital technologies.

Learning Outcomes
ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.
ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.

Prerequisites
School course

Postrequisites
Basic and profile disciplines of the EP

Physical Culture

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26478 (3012370)
Course	2
Term	2

Credits count	2
Practical and seminar classes	60hours
Total	60hours
Knowledge control form	Differentiated attestation

Short description of discipline
Provides for the joint cooperation of the teacher and the student in the process of physical education throughout the training in the context of the requirements for the level of mastering the discipline; acquisition of versatile abilities and skills for the development of physical abilities, socio-cultural experience and socio-cultural values of physical culture and sports; development of communication skills, thinking, self-development, the formation of experience in the implementation of sports and recreational and training programs.

Purpose of studying of the discipline
The purpose of the program is the formation of social and personal competencies of students and the ability to purposefully use the means and methods of physical culture, ensuring the preservation, strengthening of health to prepare for professional activities; to the persistent transfer of physical exertion, neuropsychic stress and adverse factors in future work.

Learning Outcomes
ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites
Physical Culture

Postrequisites
Basic and profile disciplines of the EP

World of Abai

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26489 (3012440)
Course	2
Term	2
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 discipline is aimed at studying historical facts, the philosophical and artistic foundations of the works of Abay Kunanbaev, Shakarim Kudaiberdiev, which form worldview and aesthetic values, the student`s ability to express his opinion, practical skills and perception of such human qualities as morality, honesty, artistic character. The genius of the writers of Kazakh literature and the role of M. Auezov in the study and popularization of Abai`s heritage, the significance of his works for history, literature and science are determined.

Purpose of studying of the discipline
Formation of the meaning of philosophical and ideological being, understanding of the problems raised in the works of Abai Kunanbayuly, Shakarim Kudaiberdiuly, Mukhtar Auezov and application of the acquired knowledge in the practice of everyday life.

Learning Outcomes
ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

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

Postrequisites
Basic and profile disciplines of the EP

Philosophy

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26552 (3012386)
Course	3
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
The discipline is aimed at developing students` openness of consciousness, understanding their own national code and self-

consciousness, spiritual modernization, competitiveness, realism and pragmatism, independent critical thinking, the cult of knowledge and education, a holistic view of philosophy as a special form of understanding the world, mastering key worldview concepts, as well as the development and strengthening of the values of tolerance, intercultural dialogue and a culture of peace.

Purpose of studying of the discipline

Formation in students of a holistic view of philosophy as a special form of knowledge of the world, its main sections, problems and methods of studying them in the context of future professional activities.

Learning Outcomes

ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites

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

Postrequisites

Basic and profile disciplines of the EP

Module 2. Psychological-pedagogical and methodological training of personnel

Age psychology and physiology

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26460 (3012418)
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 course allows you to form an idea of human anatomy and physiology, the specifics and features of age-related development, the patterns of higher nervous activity and functional features of the human nervous system are considered. Forms students` systematic understanding of mental and physiological development in ontogenesis, the main patterns of development and neoplasms of age, the most important mental features of the emerging personality of the child on the basis of taking into account psychophysiological norms.

Purpose of studying of the discipline

Formation of students` ideas about the diversity of approaches to the development of correct, scientific knowledge, mental and physiological development of a person in ontogenesis on the most important issues of psychology and physiological development in the aspect of cultural development. To equip students with theoretical and practical knowledge that contributes to strengthening their professional psychological, pedagogical and physiological training, in- depth study of the section of psychological and physiological knowledge.

Learning Outcomes

ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.

Prerequisites

School course

Postrequisites

Pedagogical practice (psychological and pedagogical)

Pedagogy

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26695 (3012431)
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

The content of the discipline is aimed at forming students` holistic understanding of the theoretical and methodological foundations of pedagogical science and the essence of professional pedagogical activity. Studying the course allows you to form the necessary knowledge about the content, principles, forms and methods of organizing a holistic pedagogical process in an educational environment. The study of the course forms the necessary competencies for the successful implementation of modern approaches in teaching and

learning.

Purpose of studying of the discipline

Pedagogy as an academic discipline aims to form students` knowledge about the object and subject of pedagogy, its functions, categorical apparatus, methodology of science.
The study of the course provides for the formation of the necessary competencies in the design and evaluation of the pedagogical process in the conditions of an educational institution .The content of the discipline topics allows you to acquire knowledge and skills in the selection and successful application of forms, means, methods of teaching and upbringing.

Learning Outcomes

ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.

Prerequisites

School course

Postrequisites

Basic and profile disciplines of the EP

Inclusive education

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26476 (3012419)
Course	2
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

When studying the discipline, students acquire knowledge about the principles and methodological foundations of inclusive education. Ideas are being formed about modern models of psychological and pedagogical support for children with special needs, the elimination of existing barriers in the legal support of inclusive education and the competence of organization and management in the area of inclusive practice. Get an idea about the models of psychological and pedagogical support for children with disabilities in educational institutions.

Purpose of studying of the discipline

The purpose of this discipline is to familiarize students with the basic provisions of the organization and management of inclusive processes in education; the formation of a dynamic, effective, self-improving specialist, ready for professional activity in an inclusive education, owning innovative technologies for building an educational route for all students, taking into account their individual needs and capabilities, able to provide social psychological and pedagogical support for children and their families.

Learning Outcomes

ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.

Prerequisites

Age psychology and physiology

Postrequisites

Basic and profile disciplines of the EP

Technologies of the updated content of education and criteria assessment

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26474 (3012395)
Course	2
Term	1
Credits count	5
Lections	30hours
Practical and seminar classes	15hours
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 course is designed to familiarize students with the technology of updated educational content and the features of criteria assessment. During the course, the main documents for secondary schools will be studied, ways of applying the basic principles of organization and planning of educational work, which have gained a permanent place in the practice of many teachers around the world, will be considered. Students master the types of criteria assessment and their features.

Purpose of studying of the discipline

To introduce the technology of the updated content of education and the features of criteria assessment, to form students` skills, such as becoming independent, self- motivated, enthusiastic, confident, responsible individuals with developed critical thinking, showing competence in digital technologies.

Learning Outcomes

ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.

Prerequisites

Pedagogy

Postrequisites

Basic and profile disciplines of the EP

Pedagogical practice

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	32885 (3012421)
Course	2
Term	2
Credits count	3
Pedagogical practics	90hours
Total	90hours
Knowledge control form	Total mark on practice

Short description of discipline

Pedagogical practice is aimed at establishing links between theoretical knowledge gained in the study of social, psychological, pedagogical and special disciplines and practice; the formation of students` practical skills and skills in planning, organizing and conducting extracurricular, educational work on the subject; the formation of students` ability to draw up appropriate documentation for work in an educational institution in accordance with the requirements of the updated content secondary education.

Purpose of studying of the discipline

Consolidation and deepening of knowledge in general scientific, cultural, psychological and pedagogical, methodological and special disciplines, as well as the formation of pedagogical skills, skills and competencies based on theoretical knowledge.

Learning Outcomes

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.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.

Prerequisites

Pedagogy

Postrequisites

Pedagogical practice

Pedagogical practice (psychological and pedagogical)

Discipline cycle	Basic disciplines
Discipline component	Compulsory component
SubjectID	26551 (3012397)
Course	2
Term	2
Credits count	2
Pedagogical practics	60hours
Total	60hours
Knowledge control form	Total mark on practice

Short description of discipline

The content of the practice is aimed at forming an idea about the features of the organization of the educational and pedagogical process and the management system in the holistic pedagogical process of the school. The student gets acquainted with all types and areas of activity of the teacher, including the system of work of the class teacher, observation during lessons and extracurricular activities, psychological and pedagogical diagnostics of the age characteristics of the development of students, and conducts psychological and pedagogical educational work.

Purpose of studying of the discipline

The purpose of pedagogical practice is the formation of professional pedagogical competencies related to the design and implementation of the educational process of teaching in the education system, providing conditions for the social and professional adaptation of students, mastering the norms and values of the teaching profession, gaining experience in practical pedagogical activity, becoming a professional orientation of their personality

Learning Outcomes

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.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.

Prerequisites

Pedagogy

Postrequisites

Pedagogical practice

Methods of mathematic teaching

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26493 (3012373)
Course	3
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

Пәннің мазмұнында мектеп математика курсының бағдарламасына сәйкес тақырыптарды оқыту әдістемесі қарастырылады. Білім алушыларға мектеп математика оқулықтары мен қосымша дидактикалық материалдарға талдау жасау, оқулықтағы теорияның баяндалу мазмұнымен танысып, берілген күрделі деңгейдегі жаттығулар жүйесін орындау ұсынылады. Пәнді оқып-үйрену барысында білім алушылардың сабақ жүргізу мен сыныптан тыс іс-шараларда оқу үрдісін жүзеге асыру үшін қажетті білім, білік, дағдылары қалыптасады.

Purpose of studying of the discipline

To acquaint students with the methodology of teaching mathematics in secondary schools, the peculiarities of the organization of training and to form students` professional competencies necessary in future professional and pedagogical activities.

Learning Outcomes

ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.

ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.

Prerequisites

Mathematic teacing theory

Postrequisites

Pedagogical practice

Module 3. Foundational level of preparation

Introduction to the profession of a mathematics teacher

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26331 (3012420)
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 designed to familiarize with pedagogical activity, its aspects. The study of the regulatory framework of pedagogical orientation. Features of teaching mathematics in various schools, taking into account the profile.. The emergence of the profession of a teacher-mathematician, its development. The role and place of a teacher in modern society. The professional and personal qualities and abilities of the teacher are considered. The requirements for the level of professional competence and knowledge are formulated.

Purpose of studying of the discipline

The objectives of the discipline are the systematization of knowledge and the study of additional sections of elementary mathematics, the development of logical thinking, algorithmic culture necessary for the development of mathematical disciplines of the basic part of the general professional cycle, the consolidation of practical skills related to algebraic transformations, solving problems of some sections of mathematical analysis.

Learning Outcomes

ON3 Apply fundamental knowledge of modern mathematics in solving practical problems in various fields of human activity. Interpret the results obtained, build hypotheses about the further course of solving the problem.

Prerequisites

School course

Postrequisites

Pedagogical practice (psychological and pedagogical)

Mathematical analysis 1

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26450 (3012353)
Course	1
Term	2
Credits count	5
Lections	30hours
Practical and seminar classes	15hours
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

A branch of mathematics in which the discipline teaches the method of studying the processes of change, movement, and dependencies between quantities in terms of their quantitative relations. When studying the discipline, the general theory of functional dependencies is considered, the real set of numbers, the sequence of numbers, the limit of the sequence, the concept of a function, the limit of a function at a point, the derivative of a function, methods of plotting a function using a derivative are studied. The student acquires fundamental knowledge of the theory of differential calculations.

Purpose of studying of the discipline

To introduce fundamental research methods by analyzing the finite quantities that make up the differential calculations of a function of one variable.

Learning Outcomes

ON3 Apply fundamental knowledge of modern mathematics in solving practical problems in various fields of human activity. Interpret the results obtained, build hypotheses about the further course of solving the problem.

Prerequisites

School course

Postrequisites

Mathematical analysis 2

Training practice

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26449 (3012391)
Course	1
Term	2
Credits count	2
Study practics	60hours
Total	60hours
Knowledge control form	Total mark on practice

Short description of discipline

Mastering the basic professional competencies, including the development of general cultural competencies of students on the basis of educational practice, consolidating and deepening the theoretical knowledge gained in the learning process, basic research skills, business correspondence skills, practical skills and work skills in accordance with the educational program. External observation of students, characteristic. Organization of educational work.

Purpose of studying of the discipline

The purpose of the training practice is the development of general cultural competencies of students, the acquisition of primary professional competencies, including the consolidation and deepening of theoretical knowledge gained in the learning process, obtaining the first skills of research, business correspondence skills, the acquisition of practical skills and work skills in accordance with the educational program

Learning Outcomes

ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.

Prerequisites

Introduction to the profession of a mathematics teacher

Postrequisites

Basic and profile disciplines of the EP

Elementary mathematic

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26332 (3012360)

Course	1
Term	2
Credits count	3
Lections	0hours
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
This course is intended for those who want to consolidate and systematize their knowledge of the general course of secondary school mathematics. The course is the basis of most special courses of the profile direction. During the study, you will learn to read mathematical records competently, formulate a brief condition of the problem and build effective algorithms for its further solution, as well as explain the principles of their construction in a qualified and accessible manner.

Purpose of studying of the discipline
Instilling in students the skills of mathematical thinking, mathematical analysis of applied problems and conducting research using basic mathematical methods. Systematization of knowledge, skills and abilities acquired in the school mathematics course.

Learning Outcomes
ON3 Apply fundamental knowledge of modern mathematics in solving practical problems in various fields of human activity. Interpret the results obtained, build hypotheses about the further course of solving the problem.

Prerequisites
School course

Postrequisites
Basic and profile disciplines of the EP

Algebra and number theory

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26464 (3012358)
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
When studying this discipline, students master such topics as second- and higher-order determinants, elements of matrix theory that are widely used in practical problems using Kramer, Gauss, Jordano-Gauss methods in solving. Also during the course the basic algebraic structures are considered: groups, rings, fields, algebras. In the course of mastering these sections, applied mathematical programs are actively used.

Purpose of studying of the discipline
To develop logical thinking, to teach how to build logical chains of reasoning, at the beginning of which there are no doubtful facts and positions, and at the end – the right conclusions;

Learning Outcomes
ON3 Apply fundamental knowledge of modern mathematics in solving practical problems in various fields of human activity. Interpret the results obtained, build hypotheses about the further course of solving the problem.

Prerequisites
Elementary mathematic

Postrequisites
Selected chapters of algebra and number theory Computable algebras Numerical methods

Analitic geometry

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26463 (3012354)
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
The content of the discipline deals with the equations of straight lines on the plane and the theory of curves of the second order. Equations of straight lines and planes in space, second- order surfaces and related concepts, elements of vector algebra and their application in solving various problems are studied. In the process of mastering the discipline, students deepen their knowledge on topics necessary in accordance with the school mathematics program, and problem-solving skills are formed.

Purpose of studying of the discipline
To introduce students to the main sections of analytical geometry, to teach techniques for solving problems by presenting knowledge about a straight line, plane, curves and surfaces of the second order.

Learning Outcomes
ON3 Apply fundamental knowledge of modern mathematics in solving practical problems in various fields of human activity. Interpret the results obtained, build hypotheses about the further course of solving the problem.

Prerequisites
School course

Postrequisites
Methods of geometric problems solution Problem-based approach in teaching geometry Geometric construction tasks

Vector and Euclidean space

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26473 (3012359)
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
The concept of vector space. Completeness and independence of the vector system. The basis of vectors in space, isomorphism of vector space, vector subspace are considered. A scalar product in Euclidean space, an orthogonal basis, and an orthogonal projection are considered. Linear mappings. Linear mapping matrices. Classification of second-order lines. Transition from one basis to another. Orthogonal transformations. Affine classification of second-order hypersurfaces

Purpose of studying of the discipline
selected chapters of algebra and number theory, mathematical logic and discrete mathematics.

Learning Outcomes
ON3 Apply fundamental knowledge of modern mathematics in solving practical problems in various fields of human activity. Interpret the results obtained, build hypotheses about the further course of solving the problem.

Prerequisites
Elementary mathematic

Postrequisites
Selected chapters of algebra and number theory Computable algebras Numerical methods

Linear algebra

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26477 (3012423)
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
The program is designed for students who have mastered a full course of mathematics at school. The results of studying the discipline can serve as a basis for such disciplines as mathematical logic and discrete mathematics, programming languages. It is planned to get acquainted with the concept of linear algebra and methods of solving problems.Familiarity with the basic concepts of algebra, teach how to solve linear algebra problems encountered in the polynomial ring. Concepts of linear space, linear independence and linear dependence, concepts of dimension, basis, rank.

Purpose of studying of the discipline

The purpose of this course is to inform the student of a known stock of information (definitions, formulas, theorems, connections between them and methods of solving problems) for the development of logical thinking and the achievement of the mathematical culture that is necessary for the study of other disciplines and subsequent work in the specialty.

Learning Outcomes

ON3 Apply fundamental knowledge of modern mathematics in solving practical problems in various fields of human activity. Interpret the results obtained, build hypotheses about the further course of solving the problem.

Prerequisites

Elementary mathematic

Postrequisites

Selected chapters of algebra and number theory Computable algebras Numerical methods

Mathematical analysis 2

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26475 (3012401)
Course	2
Term	1
Credits count	5
Lections	30hours
Practical and seminar classes	15hours
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 designed to teach integral calculus of a function of one variable and differential calculus of a function of several variables. In the process of studying the discipline, students master the concept of a primitive function, an indefinite and definite integral, ways of integrating various functions, the use of a certain integral, deepen the theoretical knowledge gained in the school mathematics course. It covers the study of the basic concepts of several variable functions, continuity, derivatives and differentials.

Purpose of studying of the discipline

It provides the formation of students ` mathematical culture, fundamental training of students in the field of mathematical analysis, mastering the modern apparatus of mathematical analysis for further application to solving problems of applied mathematics.

Learning Outcomes

ON3 Apply fundamental knowledge of modern mathematics in solving practical problems in various fields of human activity. Interpret the results obtained, build hypotheses about the further course of solving the problem.

Prerequisites

Mathematical analysis 1

Postrequisites

Mathematical analysis 3

Pedagogical practice

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26553 (3012410)
Course	3
Term	2
Credits count	5
Pedagogical practics	150hours
Total	150hours
Knowledge control form	Total mark on practice

Short description of discipline

Pedagogical practice is aimed at the formation of professional pedagogical competencies related to the design and implementation of the educational process of learning in the education system. Students master the norms and values of the teaching profession, professional orientation is carried out in obtaining experience of pedagogical activity. At the stage of theoretical training at the university, creative, research views are formed using various methods of teaching mathematics

Purpose of studying of the discipline

- consolidation of theoretical knowledge gained in the process of studying the main academic disciplines
- mastering practical skills and abilities necessary for the professional development of a specialist in mathematics
- disclosure of the links between the fundamental sciences and the tasks of practical content
- implementation of intersubject and intrasubject relations.

Learning Outcomes

ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites

Basic and profile disciplines of the EP

Postrequisites
Production (pedagogical) practice

Module 4. Theoretical and methodological level of training

Actual problems of teaching school mathematics

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26482 (3012372)
Course	2
Term	2
Credits count	5
Lections	30hours
Practical and seminar classes	15hours
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
In the content of the study of the discipline, some issues of teaching mathematics in secondary schools are considered. It tells about the development of the system of mathematical education with the use of advanced information, innovative learning technologies. Students master the problems of in-depth study of mathematics, the importance of modular learning technology, the features of the differentiated teaching method. The ways of educating creative activity and developing the scientific worldview of schoolchildren are highlighted.

Purpose of studying of the discipline
The purpose of the discipline is the formation of students` theoretical and practical knowledge and skills necessary for teaching mathematics, the introduction of innovative ideas into the educational process, modeling in educational activities necessary for a teacher to improve his professional activity.

Learning Outcomes
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.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.

Prerequisites
Introduction to the profession of a mathematics teacher

Postrequisites
Pedagogical practice

Multiple integrals

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26487 (3012398)
Course	2
Term	2
Credits count	5
Lections	30hours
Practical and seminar classes	15hours
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 student expands his knowledge of integral calculus, namely integral calculus of a function of several variables. He gets the skills of finding the volume of a body in space through a double integral, the mass of a body through a triple integral, the surface area in space through surface integrals, the mass of an arc through a curved integral. In the future, the student uses the knowledge gained on multiple integrals in the theory of vector analysis, namely, the calculation of the flow through.

Purpose of studying of the discipline
To provide students with information about multiple integrals, methods of their calculation and application of multiple integrals;
Education of a sufficiently high mathematical culture that allows you to independently expand mathematical knowledge and conduct mathematical analysis of applied problems.

Learning Outcomes
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.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.

Prerequisites
Mathematical analysis 1 Mathematical analysis 2
Postrequisites
Mathematical analysis 4

Mathematical analysis 3

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26480 (3012355)
Course	2
Term	2
Credits count	5
Lections	30hours
Practical and seminar classes	15hours
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
This discipline is designed to study the theory of series and their applications. In the process of studying the discipline, students master the signs of studying numerical, functional and power series for convergence and determining the area of their convergence, as well as the use of series in calculating limits, values of some integrals, approximate calculations of numbers. Skills of decomposition of even and odd functions into Fourier series are formed.
Purpose of studying of the discipline
To give students theoretical knowledge on the topics of numerical series, functional series, Fourier series, to teach methods of studying a series for convergence; to form students` mathematical culture, fundamental training in the field of mathematical analysis.
Learning Outcomes
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.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.
Prerequisites
Mathematical analysis 1 Mathematical analysis 2
Postrequisites
Mathematical analysis 4

Modern mathematics in the world

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26483 (3012425)
Course	2
Term	2
Credits count	5
Lections	30hours
Practical and seminar classes	15hours
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 examines the meaning, place and role of modern mathematics in the world, discoveries in science. Modern mathematics offers general and clear logical models for studying the surrounding reality. The ways of solving any problems of an economic, transport, medical, natural science nature with translation into a mathematical language, the construction of its model are considered. Students get acquainted with the achievements of mathematical schools, the place in world science, the peculiarities of development and the nature of mathematics among different peoples.
Purpose of studying of the discipline
The purpose of the discipline is to form students` ideas about the general trends in the development of mathematics, its structure, research methods, applications, history and trends of its development, about the place of mathematics in the system of sciences and the role of mathematical modeling in scientific cognition.
Learning Outcomes
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.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.

Prerequisites
Introduction to the profession of a mathematics teacher
Postrequisites
Pedagogical practice

Mathematic teacing theory

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26481 (3012371)
Course	2
Term	2
Credits count	5
Lections	30hours
Practical and seminar classes	15hours
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 designed to master the future mathematics teacher general patterns, goals and content of teaching mathematics, methodological research, the ability to apply various methods and techniques of teaching. Students get acquainted with the general problems of teaching mathematics, methods of scientific cognition in the study of the school course of mathematics, mathematical concepts and work with them, tasks and its place in teaching mathematics, ways of organizing teaching mathematics.
Purpose of studying of the discipline
To provide information on theoretical issues, methods of scientific cognition, didactic principles of teaching mathematics, to study the features of the organization of education and methods of teaching mathematics in secondary schools.
Learning Outcomes
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.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.
Prerequisites
Introduction to the profession of a mathematics teacher
Postrequisites
Pedagogical practice

Theory of functions of several variables

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26488 (3012426)
Course	2
Term	2
Credits count	5
Lections	30hours
Practical and seminar classes	15hours
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
This course is devoted to the study of functions of many variables. In the course of studying this course, students, in addition to basic concepts such as the domain of definition and the domain of meaning, will also get acquainted with the features of the theory of limits, as well as the differential calculus of functions of this kind. Particular attention in this course is paid to the applications of functions of many variables to problems of an applied nature
Purpose of studying of the discipline
Formation of systematic knowledge about modern methods of the theory of functions,
Learning Outcomes
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.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.
Prerequisites
Mathematical analysis 1 Mathematical analysis 2
Postrequisites

Mathematical analysis 4

Mathematical logic

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26503 (3012364)
Course	3
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

In the course of studying this course, students will learn how to formulate hypotheses, not only make logical conclusions, but also check and evaluate the correctness of logical reasoning based on the laws and formulas of the logic of statements. The course provides skills in working with Boolean functions, introduces students to the elements of coding theory

Purpose of studying of the discipline

To form students` clear understanding of the role and place of mathematical logic in the system of sciences; understanding of the universality of the laws of logic of mathematical reasoning; development of abstract thinking, general mathematical and information culture.

Learning Outcomes

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.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.

Prerequisites

School course

Postrequisites

Basic and profile disciplines of the EP

Mathematical logics and descrete mathematic

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26502 (3012363)
Course	3
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

This course is an important step in gaining knowledge in the field of applying mathematics to programming. During the course, the student will learn how to build mathematical models of problems from various spheres of life, as well as find algorithms for solving them suitable for machine processing of information.

Purpose of studying of the discipline

Study of the basic methods of solving combinatorial and logical problems , as well as the basics of the theory of algorithms.

Learning Outcomes

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.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.

Prerequisites

School course

Postrequisites

Basic and profile disciplines of the EP

Applied graph theory

Discipline cycle	Profiling discipline

Discipline component	Electives
SubjectID	26504 (3012424)
Course	3
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 course provides familiarity with the basic concepts of graph theory, the study of the main tasks of graph theory, algorithms for finding the main characteristics of graph structures, teaches the basic methods of graph theory, forms the skills of using algorithms to solve applied problems, the use of modern tools for the implementation of graph algorithms.

Purpose of studying of the discipline
The purpose of the discipline is to teach students methods of graph theory, to study algorithms for finding structural and numerical characteristics of graph structures; to get acquainted with the fundamental concepts and mathematical apparatus of graph theory for their subsequent use; to study the main problems of graph theory and methods of their solution

Learning Outcomes
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.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.

Prerequisites
School course

Postrequisites
Basic and profile disciplines of the EP

Features of teaching integrated lessons of algebra and geometry

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26561 (3012402)
Course	3
Term	2
Credits count	5
Lections	0hours
Practical and seminar classes	45hours
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
Deepen the knowledge, skills and abilities of future mathematics teachers in the implementation of integrated lessons in algebra and geometry. Show the features of teaching integrated lessons of algebra and geometry in the school course of mathematics and the essence of interdisciplinary connections. As well as its theoretical basis and ways of implementation, practical aspects of teaching integrated lessons in a school course

Purpose of studying of the discipline
Formation of problem-solving skills in the educational process according to the model of integration of subjects Algebra and geometry

Learning Outcomes
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.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.

Prerequisites
Elementary mathematic

Postrequisites
Production (pedagogical) practice

Practician of mathematical problems solution

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26559 (3012377)
Course	3

Term	2
Credits count	5
Lections	0hours
Practical and seminar classes	45hours
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 equip the future teacher training in specific knowledge of school mathematics, expand educational horizons of the student, to help him learn the correct general provisions on the forms and methods of teaching students mathematical activity, the development of their mathematical thinking, to explore the communication methods of teaching mathematics to philosophy, mathematics , psychology, education; explore methods of evidence, methods of solving problems, methods of teaching mathematics.

Purpose of studying of the discipline
To equip the future teacher with specific knowledge in teaching school mathematics, to expand the pedagogical horizons of the student, to help him correctly assimilate the general provisions on the forms and methods of organizing the educational mathematical activities of schoolchildren, on the development of their mathematical thinking.

Learning Outcomes
ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites
Elementary mathematic

Postrequisites
Production (pedagogical) practice

Solving parametric equations and inequalities

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26560 (3012378)
Course	3
Term	2
Credits count	5
Lections	0hours
Practical and seminar classes	45hours
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 program of the course "Solving parametric equations and inequalities" is designed to strengthen the theoretical knowledge of students, deepen their knowledge of mathematical laws, enhance their creative development through self-search. The ability to obtain mathematical knowledge by solving linear equations and inequalities with parameters, fractional rational equations and inequalities, rational equations and inequalities, irrational equations and inequalities, trigonometric equations and inequalities with parameters, exponential equations and inequalities, logarithmic equations and inequalities, they say.

Purpose of studying of the discipline
The purpose of the course is to develop students` practical skills and abilities to solve parametric equations and inequalities of mathematical problems;

Learning Outcomes
ON3 Apply fundamental knowledge of modern mathematics in solving practical problems in various fields of human activity. Interpret the results obtained, build hypotheses about the further course of solving the problem.
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.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.

Prerequisites
Elementary mathematic

Postrequisites
Production (pedagogical) practice

Geometric construction tasks

Discipline cycle	Basic disciplines

Discipline component	Electives
SubjectID	26576 (3012376)
Course	4
Term	1
Credits count	6
Lections	15hours
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	40hours
Independent work of the student	80hours
Total	180hours
Knowledge control form	Examination

Short description of discipline

When studying this subject, all types of subjects of the school curriculum are considered. They also study and analyze analyzed examples of varying complexity, tasks for self-solution and methodological recommendations for the teacher. In this course, additional attention is paid to transformation methods, the algebraic method, the method of geometric arrangement of points, a clear statement of the stages of solving construction problems, as well as the axioms of constructive geometry

Purpose of studying of the discipline

Consider the general axioms of constructive geometry; the axioms of mathematical tools;the formulation of the construction problem. To study the methodology for solving construction problems.

Learning Outcomes

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.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.
ON 10 Use additional skills and competencies in professional and daily activities.

Prerequisites

Methods of mathematic teaching Basis of problem solving methods

Postrequisites

Production (pedagogical) practice

Methods of geometric problems solution

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26578 (3012374)
Course	4
Term	1
Credits count	6
Lections	15hours
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	40hours
Independent work of the student	80hours
Total	180hours
Knowledge control form	Examination

Short description of discipline

This subject covers all sections of school geometry. It expands the pedagogical horizons of students, teaches them to draw correctly, use problem solving techniques, teach students to master the types of organization of educational and methodological activities, prove and calculate general patterns in solving problems. The GeometryPad application also teaches how to use geometric axioms and theorems in class when drawing shapes.

Purpose of studying of the discipline

Systematize the knowledge, skills and abilities of students in the course of geometry at school;
Mastering practical skills in solving mathematical problems;
Development and formation of educational and cognitive activity.

Learning Outcomes

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.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.
ON 10 Use additional skills and competencies in professional and daily activities.

Prerequisites

Methods of mathematic teaching Basis of problem solving methods

Postrequisites

Production (pedagogical) practice

Problem-based approach in teaching geometry

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26577 (3012375)
Course	4
Term	1
Credits count	6
Lections	15hours
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	40hours
Independent work of the student	80hours
Total	180hours
Knowledge control form	Examination

Short description of discipline
According to the discipline of the problem approach in teaching geometry, it covers all sections of school geometry. The curriculum includes training on how to use the Geometry Pad application. This is an indispensable addition to the study of geometry. When there is no ready approach to solving problems, a problematic situation arises, and the student`s motivation to search for such a problem increases. In the process of solving problems, teach how to solve problems that arise when solving problems.

Purpose of studying of the discipline
To supply to students with the necessary information on a problematic approach in training of geometry; to form scientific outlook at students, to develop logical thinking.

Learning Outcomes
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.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.

Prerequisites
Methods of mathematic teaching Basis of problem solving methods

Postrequisites
Production (pedagogical) practice

History and methodology of mathematics

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26587 (3012435)
Course	4
Term	1
Credits count	5
Practical and seminar classes	45hours
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 examines the objective laws of the development of mathematics. In the course of studying the discipline, students get acquainted with the history of mathematics, the epochs of the development of mathematics, the life and works of famous mathematicians, master the history of the formation of mathematical concepts. Through the reflection of the evolution of the basic concepts and ideas of mathematics studied in fundamental courses, interest in the study of the works of the classics of mathematics increases. The article describes the development of mathematics in Kazakhstan, the historical development of each content-methodical path of the school mathematics course.

Purpose of studying of the discipline
To expand and systematize students` knowledge about the path of development of mathematics and its founders, to form a holistic view of mathematical science, to reveal its methodological and ideological foundations.

Learning Outcomes
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.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites
Elementary mathematic Methods of mathematic teaching

Postrequisites
Production (pedagogical) practice

Mathematical literacy

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26580 (3012399)
Course	4
Term	1
Credits count	5
Lections	0hours
Practical and seminar classes	45hours
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 study of modern theories related to the search for solutions to problems with practical content. Informational and internal structure of school assignments with practical content. Solving various problems with parameters or logical nature. Formation of students` skills in finding ways to solve various problems with practical content. Systematization of knowledge, skills and abilities acquired by students in the school course of mathematics. The student`s ability to formulate, apply and interpret mathematics in various contexts: to use mathematical concepts, facts and tools for mathematical reasoning, description, explanation and prediction of phenomena.

Purpose of studying of the discipline

Formation of skills in the application of interdisciplinary connections, practical application of the solution of mixed tasks for the purpose of continuing education.

Instilling in students the skills of mathematical thinking, mathematical analysis of applied problems and conducting research using basic mathematical methods. Systematization of knowledge, skills and abilities acquired in the school mathematics course. The ability of the student to formulate, apply and interpret mathematics in various contexts: to use mathematical concepts, facts and means for mathematical reasoning, description, explanation and prediction of phenomena.

Learning Outcomes

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.

ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.

ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites

Basic and profile disciplines of the EP Elementary mathematic

Postrequisites

Final examination

Basis of problem solving methods

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26584 (3012411)
Course	4
Term	1
Credits count	5
Lections	0hours
Practical and seminar classes	45hours
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

In the process of studying the discipline, students get acquainted with the types of tasks, the classification of tasks, their meaning. The didactic functions of text tasks in the learning process, methods of solving problems are studied, the features of solving problems for movement, work, mixture and fusion are mastered. Students learn to establish connections between a known quantity and a desired quantity, build models of problems and find solutions using equations and systems of equations.

Purpose of studying of the discipline

Mastering the methods and techniques of solving various text problems in the school mathematics course by students.

Learning Outcomes

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.

ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.

ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites
Elementary mathematic
Postrequisites
Production (pedagogical) practice

Production (pedagogical) practice

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26570 (3012443)
Course	4
Term	2
Credits count	15
Working practice	450hours
Total	450hours
Knowledge control form	Total mark on practice

Short description of discipline
During this type of practice, students will learn how to apply their knowledge in the disciplines of the profile cycle. During the practice, there is a close acquaintance with the features of the school curriculum, with all the necessary documentation accompanying the educational process. In addition to the educational process, practice also implies the implementation of educational work, teaches qualified use of modern teaching technologies, based on the age characteristics of secondary school students.
Purpose of studying of the discipline
Conducting academic and extracurricular work in mathematics. Studying the level of knowledge, skills and abilities of students in mathematics (analysis of a class journal, notebooks of students, their control papers, etc.); development of a lesson plan during practice, development of summaries or detailed lesson plans, lectures and seminars, elective classes, classes of a circle or other extracurricular activities in mathematics, preparation of didactic materials, visual aids, electronic computing equipment for a lesson or extracurricular activity; conducting separate lessons and extracurricular activities in mathematics, attending lessons of teachers and trainees, participation in the analysis.
Learning Outcomes
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.
ON9 Apply information and communication technologies in their teaching activities in accordance with the educational program.
ON 10 Use additional skills and competencies in professional and daily activities.
Prerequisites
Basic and profile disciplines of the EP
Postrequisites
Final examination

Module 5. Research

Computable algebras

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26485 (3012427)
Course	2
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
This course studies methods for solving problems in the theory of computability and computable functions. In the course of training, students are given a stock of basic knowledge on the main sections of the theory of algorithms, ideas are formed about the theory of computability as a method of studying a wide range of solvable and unsolvable mathematical problems.
Purpose of studying of the discipline
The purpose of the discipline is to teach students methods of solving computability theory problems and appropriate thinking. In the course of training, it is required to give students a stock of basic knowledge on the main sections of the theory of algorithms, to teach the rational and effective use of the knowledge gained in solving typical problems of the theory; to form students` understanding of the theory of computability as a method of studying a wide range of solvable and unsolvable mathematical problems, the ability to classify them by levels of complexity of resolution.
Learning Outcomes
ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems

using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites

Algebra and number theory

Postrequisites

Pedagogical practice

Selected chapters of algebra and number theory

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26484 (3012393)
Course	2
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

This discipline involves students mastering the basic knowledge formed in the field of algebra and number theory, the formation of skills for their effective use in mathematics lessons and preparation for use in their future professional activities. In the process of studying the discipline, students acquire the skills of mastering the algebraic language that connects it with other fundamental sciences.

Purpose of studying of the discipline

To expand the mathematical apparatus necessary for solving both theoretical and practical problems; to instill in students the ability and skills of self-study of educational literature in mathematics; to develop logical thinking and improve the overall level of mathematical culture.

Learning Outcomes

ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites

Algebra and number theory

Postrequisites

Pedagogical practice

Numerical methods

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26486 (3012428)
Course	2
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

The subject of the discipline is a systematized concept of numerical methods for solving problems of an applied nature. In the course of studying the discipline, students get acquainted with the methods of solving linear equations and their systems, with approximate methods of integration and differentiation. Students form basic concepts about the numerical solution of the problem.

Purpose of studying of the discipline

The purpose of the discipline is to form students` concepts of approximate methods of solving applied problems, methods of mathematical modeling, sources of errors in a systematic form.

Learning Outcomes

ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.

ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites
Algebra and number theory

Postrequisites
Pedagogical practice

Mathematical analysis 4

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26490 (3012356)
Course	3
Term	1
Credits count	5
Lections	30hours
Practical and seminar classes	15hours
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 designed to teach integral calculus of a function of several variables. The content of the discipline deals with the theory of two and triple integrals, curvilinear integrals and surface integrals. Students get acquainted with the basic properties of these concepts, types of integrals, connections with each other, master the methods of calculating integrals, form graphic literacy by constructing schemes for a given area of integration on the plane and in space.

Purpose of studying of the discipline
Ensuring the formation of scientific mathematical culture of students when teaching double and triple, curved and surface integrals. Mastering the fundamental training of students in the field of mathematical analysis, mastering the modern apparatus of mathematical analysis for solving problems of applied mathematics and computer science.

Learning Outcomes
ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites
Mathematical analysis 1 Mathematical analysis 3 Mathematical analysis 2

Postrequisites
Pregraduation practice

Fourier transform and their applications

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26492 (3012422)
Course	3
Term	1
Credits count	5
Lections	30hours
Practical and seminar classes	15hours
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
In the natural and technical sciences, the Fourier transform is widely used in the study of various oscillatory, wave processes, the mathematical model of which is expressed by periodic functions. To master the Fourier transform, students must know the Fourier series and the Fourier integral, its properties. The definition and basic properties of the Fourier transform and the inverse transform in the real domain are given with proof. Learners can find for any function the Fourier transform and the cosine and sine transform. These transformations are used in solving and researching problems of mathematical physics.

Purpose of studying of the discipline
To introduce students to trigonometric series, expand their understanding of the series and the scope of their application

Learning Outcomes

ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites
Mathematical analysis 3

Postrequisites
Pregraduation practice Production (pedagogical) practice

Appendixes od rows and vector calculus

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26491 (3012357)
Course	3
Term	1
Credits count	5
Lections	30hours
Practical and seminar classes	15hours
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
This subject makes it possible to apply the knowledge gained on multiple integrals in vector field theory, as well as the ability to determine the convergence of power series to approximate calculations of function values, certain integrals, limits, differential equations. Higher order derivatives. Application of vector analysis elements to problems of physics and mechanics. Solving problems resulting in the concepts of scalar and vector fields.

Purpose of studying of the discipline
To consider the theoretical issues of vector analysis and the application of series theory, to form students` skills and problem solving skills.

Learning Outcomes
ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites
Mathematical analysis 1 Mathematical analysis 3 Mathematical analysis 2

Postrequisites
Pregraduation practice

Theory of possibility and mathematical statistics

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	26505 (3012387)
Course	3
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
This subject introduces the student to the laws of random events., mass random phenomena. To build a probabilistic model of random phenomena, the basic probability theorems (addition and multiplication theorems, total probability, repetition of tests, etc.), the laws of large numbers are used. Having the school basics of mathematical statistics, the student expands his knowledge of the methods of correlation-regression and variance analysis. When testing hypotheses put forward, learn to apply various criteria of Pearson, Student.

Purpose of studying of the discipline
To teach students the fundamental methods of studying probability theory and mathematical statistics and apply this theory to practical calculations.

The basic formulas of the application of probability theory and mathematical statistics in physics, mechanics; axiomatic approach to the definition of probabilities, the main theorems, the Bernoulli scheme, including the local and integral Laplace theorems, the concept of random variables, their numerical characteristics, the simplest random processes - Poisson.
Basic concepts of set theory, an axiomatic method of presenting probability theory. The main methods of proof and algorithms of probability theory, revealing connections. Modern mathematical modeling methods, the central limit theorem, its consequences and applications in probability theory and in related disciplines such as queuing theory.
To teach how to apply the basic methods of probability theory in solving problems in related fields of mathematics and theoretical physics. Be able to apply doc methods

Learning Outcomes

ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites

School course

Postrequisites

Methods of solving probabilistic problems

The algebra of polynomials

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26563 (3012403)
Course	3
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

Basic concepts and methods of working with polynomials, their use for solving standard applications. Ability to demonstrate the application of polynomial algebra to solve various practical problems. Getting a fundamental mathematical training in algebra and the formation of the initial level of mathematical culture sufficient for the study of other sections of higher mathematics and scientific work. Application of acquired knowledge to rationalize calculations, solve equations, evidence in solving olympiad, competitive and applied problems

Purpose of studying of the discipline

Formation of students` systematized knowledge in the field of algebra and its methods. Introduction of students to the modern mathematical apparatus of the algebra of polynomials. Education and development of mathematical culture of students. Their awareness of the applied nature of mathematics in general and the algebra of polynomials in particular, the use of the algebra of polynomials in applications and in the school course of mathematics.

Learning Outcomes

ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites

Theory of possibility and mathematical statistics

Postrequisites

Production (pedagogical) practice

Differential and integral calculations in tasks of the physics and mathematics equations

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26558 (3012362)
Course	3
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
Introduction to the theory of ordinary differential equations. General, particular, special solutions. The order of the equation. Integral curve. Entry conditions. Theorem of existence and uniqueness of a particular solution (Cauchy theorem). First order differential equations with separated, separating variables are homogeneous. Method of solution. Linear differential equation. Bernoulli equation.

Purpose of studying of the discipline
The purpose of the discipline is to study the basic concepts and methods of solving differential equations; to develop practical skills in solving and composing differential equations; to study the application of equations to various fields of economics and physics

Learning Outcomes
ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites
Mathematical analysis 3 Mathematical analysis 4

Postrequisites
Production (pedagogical) practice

Differential eguation

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26557 (3012361)
Course	3
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
The course studies methods for solving ordinary differential equations. In the course of studying the discipline, students master the mathematical apparatus of the theory of ordinary differential equations, which is necessary for solving theoretical and practical problems, as well as the development of logical thinking, which will allow mathematically correctly formulate the problems to be solved and find their solutions.

Purpose of studying of the discipline
The purpose of the discipline is to study the basic concepts of the theory of differential equations and master the basic techniques for solving practical problems on the topics of the discipline

Learning Outcomes
ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites
Mathematical analysis 1 Mathematical analysis 3 Mathematical analysis 2

Postrequisites
Production (pedagogical) practice

Methods of solving probabilistic problems

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26565 (3012404)
Course	3
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
To analyze the sections of the school mathematics course under consideration on the topics of probability theory and mathematical statistics. Consider ways to achieve the goals proposed by the long- term plan of the mathematics course at school. Providing methodological assistance to a future specialist in working on these topics. Formation of skills for solving probabilistic problems of the school mathematics course. Drawing up a lesson plan on these topics, conducting, studying analytical work.

Purpose of studying of the discipline
To study methods of solving problems in probability theory. Instilling in students the skills of mathematical thinking, mathematical analysis of applied problems at school and conducting research using basic mathematical methods. To analyze the chapters of a school textbook on the topic probabilistic problems.

Learning Outcomes
ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites
Theory of possibility and mathematical statistics

Postrequisites
Production (pedagogical) practice

Non-standardt asks of school geometry

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26567 (3012433)
Course	3
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
This discipline provides familiarity with the questions of the extracurricular geometry program. In the process of studying the discipline, geometric problems related to logical thinking are considered. The content of the subject of the discipline is aimed at mastering mathematical terms suitable for further use and at solving such problems that will help students participate in various competitions and Olympiads.

Purpose of studying of the discipline
The purpose of the discipline is to organize intellectual, practical and research activities of students aimed at the development of spatial representations, imaginative thinking, pictorial and graphic skills, techniques of constructive activity, the ability to overcome difficulties in solving mathematical problems; to form logical and abstract thinking

Learning Outcomes
ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites
Mathematical analysis 3 Mathematical analysis 4

Postrequisites
Production (pedagogical) practice

Statistical methods for processing experimental results

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26566 (3012405)
Course	3

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

To analyze the sections of the school mathematics course under consideration on the topics of probability theory and mathematical statistics. Consider ways to achieve the goals proposed by the long- term plan of the mathematics course at school. Providing methodological assistance to a future specialist in working on these topics. Formation of skills for solving probabilistic problems of the school mathematics course. Drawing up a lesson plan on these topics, conducting, studying analytical work.
Taiboldina K.
When studying this subject, the student uses the acquired knowledge of probability theory and elements of mathematical statistics in solving problems of mathematical statistics, namely correlation, regression and variance analysis, when building various models, we consider not only single- factor problems, but also statistical processing of multifactorial statistical data. The student performs laboratory work on the construction of not only linear, but also nonlinear models.

Purpose of studying of the discipline

Formation of statistical thinking of students through teaching fundamental methods of mathematical statistics

Learning Outcomes

ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites

Theory of possibility and mathematical statistics

Postrequisites

Production (pedagogical) practice

The laws of probability and methods of statistical data processing

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26574 (3012388)
Course	4
Term	1
Credits count	5
Lections	0hours
Practical and seminar classes	45hours
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 knowledge gained in the study of probability theory and mathematical statistics is used by the student in the construction of mathematical and statistical models. Perform laboratory work on the construction of a linear model, parabolic and exponential model, checking their adequacy. To do this, they learn to apply the criteria of consent of Pearson, Romanovsky, Student. Probabilistic methods are used in constructing the theoretical frequencies of a normal, exponential distribution. And they confirm the hypotheses put forward not only analytically, but also through the construction of graphs.

Purpose of studying of the discipline

The purpose of teaching the discipline is to teach students fundamental methods of mathematical statistics.

Learning Outcomes

ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites

Elementary mathematic

Postrequisites

Production (pedagogical) practice

Solving non-standard problems

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26571 (3012406)
Course	4
Term	1
Credits count	5
Lections	0hours
Practical and seminar classes	45hours
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

This course is devoted to the classification of non-standard problems, as well as the main ways to solve them, such as: search for related problems, reverse, application of graph theory, invariant, Dirichlet principle, elements of number theory. During the study of the material, students will learn to analyze non-standard tasks in order to determine the method of their solution. The course plays a leading role in the selection of material for conducting mathematical competitions of various levels.

Purpose of studying of the discipline

The tasks considered in the course should be closely related to non-standard, Olympiad tasks for secondary school students. They form the knowledge, skills, and skills of future specialists in mathematics. Mastering the ways of solving non-standard tasks.
Formation of skills, skills of using theoretical knowledge in solving Olympiad and prize-winning tasks.

Learning Outcomes

ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites

Elementary mathematic Practician of mathematical problems solution

Postrequisites

Production (pedagogical) practice

Olympiad and competitiv problems solution

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26575 (3012379)
Course	4
Term	1
Credits count	5
Lections	0hours
Practical and seminar classes	45hours
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

This course plays a leading role in the development of professional training of future teachers. Promotes the formation of work skills in classes with in-depth study of mathematics, in the organization and conduct of mathematical circles, competitions, Olympiads, etc. In the course of the study, effective methods of solving competitive and non- standard problems of mathematics are considered and analyzed, which allows the teacher to better prepare students to participate in mathematical Olympiads of various levels. Competently prove ways to solve problems. Be able to correctly compose tasks.

Purpose of studying of the discipline

Formation of skills, skills of using theoretical knowledge in solving Olympiad and competitive tasks. To familiarize with the program of international studies TIMSS, PISA, PIRLS and directions of development of functional literacy of schoolchildren. Training of a teacher who educates a competitive younger generation.

Learning Outcomes

ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites

Elementary mathematic Practician of mathematical problems solution

Postrequisites

Production (pedagogical) practice

Features studying stochastic line in school mathematics

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26579 (3012389)
Course	4
Term	1
Credits count	6
Lections	15hours
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	40hours
Independent work of the student	80hours
Total	180hours
Knowledge control form	Examination

Short description of discipline

In the process of studying the sections of the probabilistic-statistical line, probabilistic, statistical and combinatorial thinking of students is formed and develops. Stochastic line is being introduced into the school mathematics course. The probabilistic-statistical line includes elements of combinatorics, repeated and non-repeated samples. Students are taught the methodology of introducing the basic concepts of probability theory and mathematical statistics in the school mathematics course. As well as the methodology for constructing the simplest probabilistic and statistical models based on statistical data.

Purpose of studying of the discipline

The study of the topics under consideration of the discipline "Features of the study of the stochastic line in the school course of mathematics in the school course of mathematics". Methodological assistance to a future specialist in working on these topics. Learn to analyze probabilistic models and mathematical statistics problems in a school mathematics course.

Learning Outcomes

ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites

Theory of possibility and mathematical statistics

Postrequisites

Production (pedagogical) practice

And practical for solving trigonomeyric problems

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26590 (3012366)
Course	4
Term	1
Credits count	6
Lections	15hours
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	40hours
Independent work of the student	80hours
Total	180hours
Knowledge control form	Examination

Short description of discipline

To teach students to systematize methods for solving trigonometric problems in the course of mathematics and algebra. Independently study methods for solving trigonometric problems. Develop the skill of solving problems on trigonometric transformations. Formation of students` skills in finding ways to solve various problems in trigonometry. Ability to perform complex trigonometric calculations. Understand the essence of solving geometric problems produced by trigonometric expressions, as well as problems used in natural science disciplines.

Purpose of studying of the discipline

To study the existing theories related to the genesis of trigonometric problems.

Learning Outcomes

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.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.

ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites

Elementary mathematic Practician of mathematical problems solution

Postrequisites

Pregraduation practice Production (pedagogical) practice

Special course of trigonometry

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26581 (3012365)
Course	4
Term	1
Credits count	6
Lections	15hours
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	40hours
Independent work of the student	80hours
Total	180hours
Knowledge control form	Examination

Short description of discipline

The study of this discipline examines such issues as trigonometric functions and inverse trigonometric functions. Properties and graph of trigonometric functions is the theoretical basis for the study of trigonometric functions. Mastering the identical transformation, trigonometric expressions of one argument makes it possible to understand the essence of trigonometric transformations. When mastering this course, the student will learn how to prove, solve inequalities, equations, systems of equations and inequalities. The teacher pays special attention to the application of application programs: GeoGebra, Mathcad.

Purpose of studying of the discipline

Mastering by students of the basic knowledge formed in the field of pedagogical technologies, formation of skills of their effective use in mathematics lessons and preparation for their use in their professional activities. Teach to apply innovative methods of teaching mathematics and evaluate learning outcomes.

Learning Outcomes

ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Prerequisites

Elementary mathematic Practician of mathematical problems solution

Postrequisites

Production (pedagogical) practice

Pregraduation practice

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26568 (3012390)
Course	4
Term	2
Credits count	15
Undergraduate practice	450hours
Total	450hours
Knowledge control form	Total mark on practice

Short description of discipline

During this type of practice, the student will systematize the material on the research topic. He will learn how to analyze the results of his research activities and introduce them into the production process, formulate the results in the form of research articles and reports on the topic. He will also receive qualified assistance in the registration of work in accordance with the established norms and rules for the preparation of work for the passage of norm control, pre-protection and anti-plagiarism.

Purpose of studying of the discipline

The purpose of the pre- graduate practice is the formation and consolidation of the student`s skills in performing scientific and methodological research work. Pre- graduate practice is part of the educational process of training specialists working in various departments of educational fields with higher education in the future.

Learning Outcomes

ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.
ON9 Apply information and communication technologies in their teaching activities in accordance with the educational program.
ON 10 Use additional skills and competencies in professional and daily activities.

Prerequisites
Basic and profile disciplines of the EP
Postrequisites
Final examination

Module 6. Additional competencies

Appendix of functions complex variable to calculation of certain integrals

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26496 (3012416)
Course	3
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 study this course, you need basic knowledge of the theory of the function of complex variables, mathematical analysis and analytical geometry. The course studies such sections as: improper integrals over an infinite interval, improper integrals from functions unlimited on a segment, drawing up a contour integral, calculating certain integrals using contour integration in the complex plane, Fresnel integrals.
Purpose of studying of the discipline
Teaching students fundamental methods of the theory of the function of a complex variable
Learning Outcomes
ON9 Apply information and communication technologies in their teaching activities in accordance with the educational program.
ON 10 Use additional skills and competencies in professional and daily activities.
Prerequisites
Mathematical analysis 1 Mathematical analysis 2
Postrequisites
Production (pedagogical) practice

Theory of complex variable function

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26497 (3012417)
Course	3
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
Students finish the school course with a set of real numbers. This mathematics course introduces students to a variety of complex numbers. A new concept appears as a complex plane, an analytical expression of various lines through a function of a complex variable. We expand the skills of students in calculating curvilinear integrals by calculating the integral of a complex function. To get acquainted with a new concept as a deduction and its application in calculating the integral of a complex function along a circle.
Purpose of studying of the discipline
The purpose of mastering the discipline is to familiarize students with one of its most important sections – methods and techniques of functional analysis on the example of the theory of infinite-dimensional linear operators. Formation of ideas about the basic concepts and methods of the theory of functions of a complex variable, its relationship with other mathematical and physical disciplines.
Learning Outcomes
ON 10 Use additional skills and competencies in professional and daily activities.
Prerequisites
Mathematical analysis 3 Mathematical analysis 2
Postrequisites
Production (pedagogical) practice

Multimedia Processing Technology

Discipline cycle	Basic disciplines

Discipline component	Electives
SubjectID	26500 (3012430)
Course	3
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
As part of the study of the discipline, students get acquainted with the general concepts and definitions in the field of multimedia technologies, the scope, history of development, directions and application of multimedia technologies. The laws and principles of constructing animation, timing rules, calculating the playback time of an animation fragment, the rules for overlaying sound and building multimedia clips, including video, animation and sound, are studied. The means of stylistic integrity of multimedia design are considered.

Purpose of studying of the discipline
Formation of theoretical ideas about the history of multimedia development, scope, obtaining practical skills in creating and processing multimedia information

Learning Outcomes
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.
ON9 Apply information and communication technologies in their teaching activities in accordance with the educational program.

Prerequisites
Mathematic teacing theory Information and communication technology

Postrequisites
Pedagogical practice

Physics-1

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26501 (3012432)
Course	3
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
kinematics and dynamics of material tochki. Zakony Newton. Strength. Mass. Impulse. Mooment momentum inertia. Laws of conservation in mechanics. Dynamics of a system of material points. Mechanics of Solids. Space velocity. The movement of the planets, the laws Keplara. Stir in the INSS. The forces of inertia in the INSS, Elements of special relativity. Mechanics of liquids and gases. Oscillations and waves. The flow of energy . Vector minds. Interference of waves. The Doppler effect in acoustics.

Purpose of studying of the discipline
Future specialists need to be guided by scientific and technical information, to know the physical principles and laws. Basic concepts, physical quantities, their mathematical records, units of measurement, fundamentals of practical methods and processing of measurement results. It is also the provision of fundamental physical training that allows you to use the results of physical discoveries in the field of technologies with which they work.

Learning Outcomes
ON 10 Use additional skills and competencies in professional and daily activities.

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
Production (pedagogical) practice

Forms and methods of STEM learning

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26498 (3012429)
Course	3
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 the formation of knowledge and skills in the use of various forms and methods of STEM education, as well as the ability to evaluate the effectiveness of their application. Students learn the basic concepts, learning objectives within STEM. In the course of studying the discipline, students learn to apply modern educational technologies as part of the implementation of STEM education, learn the methods of organizing and conducting project work.

Purpose of studying of the discipline
Prepare students for the use of STEM learning technology in the educational process, teach them how to use various forms and methods of STEM learning in practice, and integrate STEM activities into the learning process.

Learning Outcomes
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.
ON9 Apply information and communication technologies in their teaching activities in accordance with the educational program.
ON 10 Use additional skills and competencies in professional and daily activities.

Prerequisites
Mathematic teacing theory Information and communication technology

Postrequisites
Pedagogical practice

Electronic educational resources

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26494 (3012394)
Course	3
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
This discipline is focused on familiarizing students with the possibilities of electronic educational resources, their types and features of use in future professional activities, both as a teaching tool and as a management of the educational process. Also, in the course of studying the discipline, students will master the practical skills of developing educational resources in their specialization using modern tools and study the methodology for organizing educational activities based on them.

Purpose of studying of the discipline
Formation of systematized knowledge in the field of development and use of various kinds of electronic educational resources in the future professional activity of a teacher

Learning Outcomes
ON9 Apply information and communication technologies in their teaching activities in accordance with the educational program.
ON 10 Use additional skills and competencies in professional and daily activities.

Prerequisites
Mathematic teacing theory

Postrequisites
Pedagogical practice

Differential geometry and topology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26554 (3012414)
Course	3
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
The subject of differential geometry and topology is the formation of a student`s mathematical culture in the field of geometry and topology. In the course of teaching this discipline, there is an expansion and systematization of students` knowledge in the field of studying and describing the environment using basic geometric and topological methods, the skills of using which underlie the application of theoretical research in solving problems of a practical nature.

Purpose of studying of the discipline
The purpose of this course is to inform the student of a known stock of information(definitions, formulas, theorems, connections between them and methods of solving problems) for the development of logical thinking and achieving the mathematical culture that is necessary for studying other disciplines and subsequent work in the specialty. Getting an idea about the methods of topology; knowledge about the basic concepts and results of combinatorial topology; the ability to solve various specific problems by means of topology.

Learning Outcomes
ON 10 Use additional skills and competencies in professional and daily activities.

Prerequisites
Mathematical analysis 3 Mathematical analysis 4

Postrequisites
Production (pedagogical) practice

Physics 2

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26556 (3012434)
Course	3
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
The geometrical optics, physical optics, light generation, nonlinear phenomena in optics. The development of quantum concepts, corpuscle wave- particle duality, the quantum- mechanical description of atomic systems, quantum properties of solids, elementary processes in gases and plasmas. General properties of atomic nuclei, radioactivity, nuclear reactions, fission and fusion of atomic nuclei, models of atomic nuclei. Interaction of nuclear radiation with matter.

Purpose of studying of the discipline
knowledge of physics required for the specialty, assistance in correctly understanding the meaning of the laws of physics, obtaining knowledge about the main phenomena, the features of their passage, basic concepts, physical quantities, their mathematical notation, units of measurement; the basics of practical methods and processing of measurement results;

Learning Outcomes
ON 10 Use additional skills and competencies in professional and daily activities.

Prerequisites
Mathematical analysis 3 Mathematical analysis 4

Postrequisites
Production (pedagogical) practice

Functional analysis

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26555 (3012415)
Course	3
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
The discipline functional analysis studies the theory of metric and normed spaces, as well as the theorem on spaces with a scalar product. The basic concepts of such sections as subspace, separable space are considered. Linear functionals in normalized spaces and the basic concepts of the theory of linear (closed, bounded, compact, Hilbert– Schmidt) operators operating in infinite- dimensional Hilbert spaces are studied. The spectraltheoryofautonomouscompactoperatorsisconsidered

Purpose of studying of the discipline

Formation of mathematical culture of students, development of systematic mathematical thinking. The study of the dynamic characteristics of the system by determining the processes of changing its state over time based on the accepted algorithms of functioning.

Learning Outcomes

ON 10 Use additional skills and competencies in professional and daily activities.

Prerequisites

Mathematical analysis 3 Mathematical analysis 4

Postrequisites

Production (pedagogical) practice

Academic writing and the basics of scientific research

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26573 (3012438)
Course	4
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

In the process of studying the discipline, knowledge of the norms of the literary language is formed, the culture of speech, oral and written speech is developed through the use of phraseological phrases, proverbs and sayings, skills of using language in interpersonal and professional communications are formed. During the study, students will be able to master the language means of scientific style, improving the skills of creating and formatting their own scientific texts.

Purpose of studying of the discipline

The purpose of mastering the discipline is to familiarize students with the main features of the scientific style of speech.

Learning Outcomes

ON 10 Use additional skills and competencies in professional and daily activities.

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Final examination Pregraduation practice

Management in education

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26605 (3013934)
Course	4
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 study the general concepts of management, its functions and historical aspects of the development of the theory and practice of management, the place and role of the leader`s personality in organizational structures. Consider the general characteristics of pedagogical management; basic concepts, goals, objectives, functions and principles of pedagogical management. Methods of pedagogical management: economic, organizational and managerial, psychological and pedagogical influence. Factors that determine the effectiveness of pedagogical management; the results of the activities of the subjects of pedagogical management and their evaluation.

Purpose of studying of the discipline

The purpose of mastering the discipline is to study by students the theoretical foundations of management in the structure of the educational system. The study of the discipline contributes to the formation of the student`s skills in using the basic principles, methods and mechanisms of management in the field of education, which, in turn, will improve the professional qualities of future teachers and help them in their professional growth.

Learning Outcomes

ON9 Apply information and communication technologies in their teaching activities in accordance with the educational program.
ON 10 Use additional skills and competencies in professional and daily activities.

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Pregraduation practice

Applied programs in mathematics

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26572 (3012439)
Course	4
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

Mastering by students of theoretical knowledge and practical skills of working with modern application software packages for practical application and solving mathematical problems. Familiarization of students with the capabilities of modern software designed to solve mathematical problems. Assistance in acquiring knowledge and concepts about application software packages, skills in working with programs for solving mathematical problems.

Purpose of studying of the discipline

The purpose of studying the discipline is to master the basic methods of working with application software packages to use their resources in solving mathematical problems.

Learning Outcomes

ON9 Apply information and communication technologies in their teaching activities in accordance with the educational program.
ON 10 Use additional skills and competencies in professional and daily activities.

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Pregraduation practice Production (pedagogical) practice

Active teaching methods in math lessons

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26589 (3012437)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	0hours
Laboratory works	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 state of the methodology of teaching mathematics based on the implementation of innovative approaches to teaching, as well as the experience of using active teaching methods in mathematics lessons. The possibility and expediency of using active methods of teaching mathematics, to determine the organizational and pedagogical conditions for their use. The effectiveness of training future teachers to master the skills of using active teaching methods in professional activities.

Purpose of studying of the discipline

Familiarization of students with existing theoretical materials, didactic manuals, visual illustrations. To teach them to use all opportunities for the development of the student`s personality, his active mental growth, where there is an independent search for the student, as well as research activities, various creative work.

Learning Outcomes

ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.
ON 10 Use additional skills and competencies in professional and daily activities.

Prerequisites

Mathematic teacing theory Methods of mathematic teaching

Postrequisites

Production (pedagogical) practice

Educational robotics at school

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26582 (3012407)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	0hours
Laboratory works	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, built on the principle of practical implementation of projects, provides basic knowledge and skills in the field of robotics. During the course of studying the discipline, students will assemble, design, model and program robots to solve various tasks. During the study of the discipline, LEGO® MINDSTORMS® EV3 constructors will be used, which are an advanced training platform and provide an opportunity to gain practical experience.

Purpose of studying of the discipline
the formation of a system of knowledge, skills and abilities in the field of robotics among future teachers is one of the most important areas of scientific and technological progress, in which the problems of mechanics and new technologies come into contact with the problems of artificial intelligence.

Learning Outcomes
ON9 Apply information and communication technologies in their teaching activities in accordance with the educational program.
ON 10 Use additional skills and competencies in professional and daily activities.

Prerequisites
Information and communication technology

Postrequisites
Production (pedagogical) practice

Workshop solving problems in mechanics

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26588 (3012436)
Course	4
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 mechanics problem solving workshop teaches students how to solve problems of any complexity in the mechanics section, find the coordinates of material points, and plot changes in vector quantities over time. Forms the ability to apply techniques to vector quantities, as well as apply the theoretical knowledge gained by students in mathematics and physics. in practice.

Purpose of studying of the discipline
The study of the basic experimental laws and laws underlying mechanics, mastering by students the method of scientific physical cognition of natural phenomena

Learning Outcomes
ON 10 Use additional skills and competencies in professional and daily activities.

Prerequisites
Physics-1 Physics 2

Postrequisites
Production (pedagogical) practice

Theory of matrices

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26586 (3012413)
Course	4
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 course provides for the study of the basic concepts of matrix theory, obtaining basic knowledge, skills and abilities in the theory of matrix calculus. The application of matrix operations in various fields is considered. In the process of studying the discipline, students form solid theoretical knowledge in the field of matrix theory, which are necessary for the study of systems of linear differential equations and solving applied problems.

Purpose of studying of the discipline
The study of the basic concepts of matrix theory and its application in various fields, the application of basic concepts, laws, classical and modern theories of mathematics, scientific literature

Learning Outcomes
ON 10 Use additional skills and competencies in professional and daily activities.

Prerequisites
Analitic geometry Algebra and number theory Differential eguation

Postrequisites
Production (pedagogical) practice

Equation of mathematical physics

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26585 (3012412)
Course	4
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
This discipline is based on the fundamental concepts of mathematics that study objectively existing laws of nature, and also complements the quantitative indicators of the laws of mathematics. Along with the study of various fields of sciences (physics, engineering), ongoing changes and phenomena in the Macro and microcosm, their mathematical models can be expressed in partial differential equations. And their decisions reflect the patterns of the processes taking place.

Purpose of studying of the discipline
The purpose of this course is to inform the student of a known stock of information(definitions, formulas, theorems, connections between them and methods of solving problems) for the development of logical thinking and achieving the mathematical culture that is necessary for studying other disciplines and subsequent work in the specialty.

Learning Outcomes
ON 10 Use additional skills and competencies in professional and daily activities.

Prerequisites
Differential eguation

Postrequisites
Production (pedagogical) practice

Digital tools and services for educational content creation

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26583 (3012408)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	0hours
Laboratory works	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

In the course of studying the discipline, students get acquainted with the types of educational content, the functions performed, the stages and technology of creation, quality requirements, as well as methods of application in future professional activities. The practical component of the discipline is aimed at obtaining the skills to create full-featured educational content using modern tools (sound and video processing tools, infographics, services for creating online tasks, courses, etc.).

Purpose of studying of the discipline

Formation of theoretical and practical skills in the creation and use of digital educational resources using modern tools

Learning Outcomes

ON9 Apply information and communication technologies in their teaching activities in accordance with the educational program.
ON 10 Use additional skills and competencies in professional and daily activities.

Prerequisites

Information and communication technology

Postrequisites

Production (pedagogical) practice

Final examination

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

Graduate work

Credits count	8

Comprehensive exam

Credits count	8

4.Summary table on the scope of the educational program

«6B01501 - Mathematics»

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

Mathematical analysis 1	BS/US	2	5	150	30	15		35	70	Examination
Training practice	BS/US	2	2	60						Total mark on practice
Elementary mathematic	BS/US	2	3	90	0	30		20	40	Examination
Algebra and number theory	BS/CCh	3	5	150	15	30		35	70	Examination
Analitic geometry	BS/US	3	5	150	15	30		35	70	Examination
Vector and Euclidean space	BS/CCh	3	5	150	15	30		35	70	Examination
Linear algebra	BS/CCh	3	5	150	15	30		35	70	Examination
Mathematical analysis 2	BS/US	3	5	150	30	15		35	70	Examination
Pedagogical practice	BS/US	6	5	150						Total mark on practice
Module 4. Theoretical and methodological level of training										
Actual problems of teaching school mathematics	BS/CCh	4	5	150	30	15		35	70	Examination
Multiple integrals	BS/CCh	4	5	150	30	15		35	70	Examination
Mathematical analysis 3	BS/CCh	4	5	150	30	15		35	70	Examination
Modern mathematics in the world	BS/CCh	4	5	150	30	15		35	70	Examination
Mathematic teacing theory	BS/CCh	4	5	150	30	15		35	70	Examination
Theory of functions of several variables	BS/CCh	4	5	150	30	15		35	70	Examination
Mathematical logic	AS/CCh	5	5	150	15	30		35	70	Examination
Mathematical logics and descrete mathematic	AS/CCh	5	5	150	15	30		35	70	Examination
Applied graph theory	AS/CCh	5	5	150	15	30		35	70	Examination
Features of teaching integrated lessons of algebra and geometry	AS/CCh	6	5	150	0	45		35	70	Examination
Practician of mathematical problems solution	AS/CCh	6	5	150	0	45		35	70	Examination
Solving parametric equations and inequalities	AS/CCh	6	5	150	0	45		35	70	Examination
Geometric construction tasks	BS/CCh	7	6	180	15	45		40	80	Examination
Methods of geometric problems solution	BS/CCh	7	6	180	15	45		40	80	Examination
Problem-based approach in teaching geometry	BS/CCh	7	6	180	15	45		40	80	Examination
History and methodology of mathematics	AS/CCh	7	5	150		45		35	70	Examination
Mathematical literacy	AS/CCh	7	5	150	0	45		35	70	Examination
Basis of problem solving methods	AS/CCh	7	5	150	0	45		35	70	Examination
Production (pedagogical) practice	AS/CCh	8	15	450						Total mark on practice
Module 5. Research										
Computable algebras	BS/CCh	4	5	150	15	30		35	70	Examination
Selected chapters of algebra and number theory	BS/CCh	4	5	150	15	30		35	70	Examination
Numerical methods	BS/CCh	4	5	150	15	30		35	70	Examination
Mathematical analysis 4	BS/CCh	5	5	150	30	15		35	70	Examination

Fourier transform and their applications	BS/CCh	5	5	150	30	15		35	70	Examination
Appendixes od rows and vector calculus	BS/CCh	5	5	150	30	15		35	70	Examination
Theory of possibility and mathematical statistics	AS/US	5	5	150	15	30		35	70	Examination
The algebra of polynomials	AS/CCh	6	5	150	15	30		35	70	Examination
Differential and integral calculations in tasks of the physics and mathematics equations	AS/CCh	6	5	150	15	30		35	70	Examination
Differential eguation	AS/CCh	6	5	150	15	30		35	70	Examination
Methods of solving probabilistic problems	AS/CCh	6	5	150	15	30		35	70	Examination
Non-standardt asks of school geometry	AS/CCh	6	5	150	15	30		35	70	Examination
Statistical methods for processing experimental results	AS/CCh	6	5	150	15	30		35	70	Examination
The laws of probability and methods of statistical data processing	BS/CCh	7	5	150	0	45		35	70	Examination
Solving non-standard problems	BS/CCh	7	5	150	0	45		35	70	Examination
Olympiad and competitiv problems solution	BS/CCh	7	5	150	0	45		35	70	Examination
Features studying stochastic line in school mathematics	AS/CCh	7	6	180	15	45		40	80	Examination
And practical for solving trigonomeyric problems	AS/CCh	7	6	180	15	45		40	80	Examination
Special course of trigonometry	AS/CCh	7	6	180	15	45		40	80	Examination
Pregraduation practice	AS/CCh	8	15	450						Total mark on practice
Module 6. Additional competencies										
Appendix of functions complex variable to calculation of certain integrals	BS/CCh	5	5	150	15	30		35	70	Examination
Theory of complex variable function	BS/CCh	5	5	150	15	30		35	70	Examination
Multimedia Processing Technology	BS/CCh	5	5	150	15	30		35	70	Examination
Physics-1	BS/CCh	5	5	150	15	30		35	70	Examination
Forms and methods of STEM learning	BS/CCh	5	5	150	15	30		35	70	Examination
Electronic educational resources	BS/CCh	5	5	150	15	30		35	70	Examination
Differential geometry and topology	BS/CCh	6	5	150	15	30		35	70	Examination
Physics 2	BS/CCh	6	5	150	15	30		35	70	Examination
Functional analysis	BS/CCh	6	5	150	15	30		35	70	Examination
Academic writing and the basics of scientific research	BS/CCh	7	5	150	15	30		35	70	Examination
Management in education	BS/CCh	7	5	150	15	30		35	70	Examination
Applied programs in mathematics	BS/CCh	7	5	150	15	30		35	70	Examination
Active teaching methods in math lessons	AS/CCh	7	5	150	15	0	30	35	70	Examination
Educational robotics at school	AS/CCh	7	5	150	15	0	30	35	70	Examination
Workshop solving problems in mechanics	AS/CCh	7	5	150	15	30		35	70	Examination
Theory of matrices	AS/CCh	7	5	150	15	30		35	70	Examination

Equation of mathematical physics	AS/CCh	7	5	150	15	30		35	70	Examination
Digital tools and services for educational content creation	AS/CCh	7	5	150	15	0	30	35	70	Examination
Final examination										
Graduate work		8	8	240						
Comprehensive exam		8	8	240						