The list of academic disciplines of the university component

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

6B015 - Training of teachers in Natural science subjects
(Code and classification of the direction of training)

0114
(Code in the International Standard Classification of Education)

B010 - Physics teacher training
(Code and classification of the educational program group)

6B01514 - Physics (IP)
(Code and name of the educational program)

bachelor
(Level of preparation)

set of 2024

Semey 2024

Developed
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Approved
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Abaistudies

Discipline cycle	Basic disciplines
Course	1
Credits count	2
Knowledge control form	Examination

Short description of discipline
Formation of a full-fledged, human-loving, humane, tolerant citizen who succumbs to the humanistic teachings of Abai. Education of deep love for Abai s thoughts about eternal values: reading, education, science, art, education, morality reflected in his poems and prose; reflection of the main sources that influenced the worldview of the poet-thinker.

Purpose of studying of the discipline
Familiarization with the works of the founders of Abai studies.
A deeper understanding of the content, meanings, artistic power of Abai s works, understanding the meaning and meaning of the poet s poetry, his artistic qualities, nutrients.

Learning Outcomes
ON 2 To collect and interpret information for the formation of knowledge taking into account social, ethical and scientific considerations, critically evaluate their values, attitudes, ethical principles and teaching methods, set new goals for their own pedagogical development.
ON 6 To cover holistically and objectively the main stages of the history, evolution of the forms of statehood and civilization of the Kazakh people, to know the methods of scientific research and academic writing, to understand the importance of the principles and culture of academic honesty.

Learning outcomes by discipline
-to collect and interpret information for the formation of knowledge, taking into account social, ethical and scientific considerations, critically evaluate their values, attitudes, ethical principles and teaching methods, set new goals for their own pedagogical development
-to understand the psychological and pedagogical problems of teaching and educating students with disabilities in inclusive education, to take into account the diverse abilities of students in the learning process, to ethically support their psychological well-being in the life and educational context

Prerequisites
Kazakh(Russian) language (1)

Postrequisites
Basic and profile disciplines of the EP

Mechanics

Discipline cycle	Profiling discipline
Course	1
Credits count	6
Knowledge control form	Examination

Short description of discipline
In the process of studying the discipline, knowledge is formed about the basic laws and principles of the mechanical motion of solid bodies, the laws of Newton and Kepler, the laws of conservation in mechanics, the laws of planetary motion, oscillations and waves, the Doppler effect in acoustics. Students gain knowledge about the theoretical foundations of the practical application of mechanical phenomena, which forms an idea of the transmission of pressure in solids, liquids and gases, atmospheric pressure, fluid and gas mechanics.

Purpose of studying of the discipline
- study of the theoretical foundations of classical and modern mechanics;
- formation of modern physical and scientific outlook among students;
- to teach students to quantitatively formulate and solve problems using the basic laws of mechanics;
- to teach certain skills and abilities of experimental research using modern
laboratory instruments and information technology.

Learning Outcomes
ON 7 Demonstrate strong academic and practical knowledge in the field of physics, operate with forms and methods of scientific knowledge, various ways of mastering the surrounding world, understand the role of science in the development of society.
ON 8 To conduct scientific research in the chosen field of experimental and theoretical physical research with the help of modern instrumentation and information technology, taking into account domestic and foreign experience.
ON 9 Apply modern methods of processing, analysis and synthesis of physical information in their chosen field of physical research, operate with basic mathematical concepts and operations and are able to apply them in solving physical problems, implement analytical and technological solutions in the field of experimental and theoretical physics.

Learning outcomes by discipline
ON3 Use fundamental knowledge of physics when solving basic problems of physics, physical phenomena,
explanations of basic physical terms, quantities, their mathematical expression and units of measurement.
ON4 Conducting experiments in classical branches of physics, comprehensively solving typical problems using
physical terms. Creation of an algorithm for the structure of physical problems, competent formulation of proofs.
1) Learn the physical meaning of the basic concepts and laws.
2) Apply basic and special knowledge in the field of physical sciences in scientific activities, experiment planning;
3) Apply basic knowledge in the field of informatics and natural sciences in cognitive and professional activities.

Prerequisites
School course

Postrequisites
Workshop on mechanics

Pedagogical practice

Discipline cycle	Basic disciplines
Course	1
Credits count	2
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
ON 1 Possess intercultural and communicative competence, apply skills of independent continuation of further education and build professional relationships in pedagogical and social activities; purposefully use means and methods that ensure the preservation and strengthening of health in professional activities.
ON 2 To collect and interpret information for the formation of knowledge taking into account social, ethical and scientific considerations, critically evaluate their values, attitudes, ethical principles and teaching methods, set new goals for their own pedagogical development.
ON 4 Understand the psychological and pedagogical problems of teaching and educating students with disabilities in inclusive education, take into account the diverse abilities of students in the learning process, ethically support their psychological well-being in the life and educational context.

Learning outcomes by discipline
To know
1. the essence of general pedagogical methods and forms of education;
2. features of pedagogical technologies and the mechanism of their implementation;
3. types of educational work used in schools, including – types of educational work of the school;
4. goals and objectives of the academic discipline in which classes were held during the practice;
5. methodological techniques used in carrying out a specific type of educational work.
- knows how to plan events.
- knows the basic requirements for the organization of classes.
- able to organize pedagogical communication with students

Prerequisites
Pedagogical practice

Postrequisites
Pedagogical practice

Age and physiological features of children s development

Discipline cycle	Basic disciplines
Course	1
Credits count	3
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
to monitor the development of students, plan and implement age-appropriate learning processes, taking into account the individual needs of students, creatively support universal learning and the well-being of students. Students can: Recognize individual starting points of different students, their learning potential and needs for specific support; consider the individual needs of their students for specific support, guidance, training and evaluation.

Learning Outcomes
ON 1 Possess intercultural and communicative competence, apply skills of independent continuation of further education and build professional relationships in pedagogical and social activities; purposefully use means and methods that ensure the preservation and strengthening of health in professional activities.
ON 2 To collect and interpret information for the formation of knowledge taking into account social, ethical and scientific considerations, critically evaluate their values, attitudes, ethical principles and teaching methods, set new goals for their own pedagogical development.
ON 4 Understand the psychological and pedagogical problems of teaching and educating students with disabilities in inclusive education, take into account the diverse abilities of students in the learning process, ethically support their psychological well-being in the life and educational context.

Learning outcomes by discipline
Must know:
- The structure and functions of the human body as a single integral system, about the processes occurring in it and the mechanisms of its activity;
- General patterns of growth and development of the body of children and adolescents;
- Methods for determining the physical development and physical performance of schoolchildren;
- Methods of studying the mental performance of schoolchildren;
- Dynamic stereotype and its importance in the education and upbringing of a student;
- Age-related features of the functioning of visceral systems;
- The biological nature and integrity of the human body as a self-regulating system;
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

Prerequisites

School course

Postrequisites

Basic and profile disciplines of the EP

Education Science and Key Learning Theories

Discipline cycle	Basic disciplines
Course	2
Credits count	4
Knowledge control form	Examination

Short description of discipline

The content of the discipline covers a range of issues, including patterns and principles of learning, basic didactic concepts and features of the content of education; methods, means, forms and technologies of learning.

Purpose of studying of the discipline

Expansion and formation of knowledge about learning theories, modern didactic concepts and innovative learning technologies.

Learning Outcomes

ON 5 To recognize and understand fundamental scientific concepts that have fundamental methodological and theoretical significance for understanding and mastering the physical sciences, to argue their own position of applying and integrating knowledge from other fields of sciences to solve global and local problems of physics.
ON 11 Work in interdisciplinary teams, have the skills to apply scientific knowledge in solving social problems.
ON 12 Understand the scientific principles and logic of developing a school physics course, apply various learning technologies in their diversity and to the place.

Learning outcomes by discipline

ON 5 To form personal qualities that provide in-depth special empirical and theoretical knowledge, skills and abilities of practical and theoretical actions on the theory and technology of teaching physics, on innovative pedagogical technologies.
ON 11 Work in interdisciplinary teams, have the skills to apply scientific knowledge in solving social problems.
Knows the essence of pedagogical , classification and principles of implementation of pedagogical technologies.
He is able to carry out professional activities based on the following technologies: health-saving, personality-oriented, activation of cognitive activity, developmental learning.

Prerequisites

Education Science and Key Learning Theories

Postrequisites

Methods and technologies of teaching physics

Psychology, interaction and communication in education

Discipline cycle	Basic disciplines
Course	2
Credits count	5
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

ON 2 To collect and interpret information for the formation of knowledge taking into account social, ethical and scientific considerations, critically evaluate their values, attitudes, ethical principles and teaching methods, set new goals for their own pedagogical development.
ON 4 Understand the psychological and pedagogical problems of teaching and educating students with disabilities in inclusive education, take into account the diverse abilities of students in the learning process, ethically support their psychological well-being in the life and educational context.

Learning outcomes by discipline

to know: – general patterns of the psyche, psychological patterns of formation of a person as a personality; – age-related features of mental properties, states and
processes;
be able to: – study personality traits, abilities, motives of activity and individual psychological characteristics of students using psychological diagnostic methods;
possess: - organizational and communicative inclinations and abilities; – self–regulation of mental state in unforeseen professional and life circumstances;
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 studies

Workshop on mechanics

Discipline cycle	Profiling discipline
Course	2
Credits count	3
Knowledge control form	Examination

Short description of discipline
In the process of mastering the discipline, the classification and methods of solving physical problems, the main characteristics and ratios of kinematics, dynamics of a material point, and conservation laws are considered. The sections of mechanics provide information about various forms of motion and interaction, the work of force and its expression by a curved integral. Considers the dynamics of an absolutely rigid body. Explains the motion in a relatively non-inertial system when solving problems. Demonstrates mechanical vibrations, taking into account the general properties of liquids and gases.
Purpose of studying of the discipline
Show ways to use and how practical application of theoretical material from the section "Mechanics"
Learning Outcomes
ON 7 Demonstrate strong academic and practical knowledge in the field of physics, operate with forms and methods of scientific knowledge, various ways of mastering the surrounding world, understand the role of science in the development of society.
ON 8 To conduct scientific research in the chosen field of experimental and theoretical physical research with the help of modern instrumentation and information technology, taking into account domestic and foreign experience.
ON 9 Apply modern methods of processing, analysis and synthesis of physical information in their chosen field of physical research, operate with basic mathematical concepts and operations and are able to apply them in solving physical problems, implement analytical and technological solutions in the field of experimental and theoretical physics.
Learning outcomes by discipline
must be able to:
-apply general laws of physics to solve specific problems of mechanics and at
the interdisciplinary boundaries of mechanics with other fields of knowledge; - use basic measuring instruments used in mechanics, set and solve the simplest experimental problems in mechanics;
must possess:
- basic skills of working with educational and scientific literature; - skills of solving problems in the course of general physics
ON 7 Apply modern information and communication technologies in the educational process and develop
didactic materials, virtual experiments and demonstrations in physics.
ON 8 Develop the ability for theoretical and experimental research in the chosen field of physics, take into account
modern trends in the development of physics in their professional activities
Prerequisites
Mechanics
Postrequisites
Electricity and magnetism

Electricity and magnetism

Discipline cycle	Profiling discipline
Course	2
Credits count	7
Knowledge control form	Examination

Short description of discipline
In the process of studying the discipline of electricity and magnetism, knowledge is formed about the electric field, its main characteristics, direct electric current, phenomena related to magnetic fields, and the connections between the electric and magnetic fields. It provides knowledge that the electric field is created by electric charges, and the magnetic field is created by a conductor with a permanent magnet and current, and the electric and magnetic fields form a single electromagnetic field.
Purpose of studying of the discipline
- formation of students` systematic knowledge about the basic concepts and laws of electromagnetism
Learning Outcomes
ON 7 Demonstrate strong academic and practical knowledge in the field of physics, operate with forms and methods of scientific knowledge, various ways of mastering the surrounding world, understand the role of science in the development of society.
ON 8 To conduct scientific research in the chosen field of experimental and theoretical physical research with the help of modern instrumentation and information technology, taking into account domestic and foreign experience.
ON 9 Apply modern methods of processing, analysis and synthesis of physical information in their chosen field of physical research, operate with basic mathematical concepts and operations and are able to apply them in solving physical problems, implement analytical and technological solutions in the field of experimental and theoretical physics.
Learning outcomes by discipline
Has basic knowledge in the field of physical and mathematical sciences necessary to solve professional problems. Applies physical laws in a reasoned manner
and mathematical methods for solving theoretical and applied problems.
ON3 Use the fundamental knowledge of physics in solving the basic problems of physics, physical phenomena, in explaining the basic physical terms, quantities, their mathematical expression and units of measurement.
ON4 Conducting experiments in the classical sections of physics, solving typical problems comprehensively, using physical terms.
Creating an algorithm for the structure of physical problems, competent formulation of proofs

Prerequisites
Molecular physics
Postrequisites
Optics

Pedagogical studies

Discipline cycle	Basic disciplines
Course	2
Credits count	5
Knowledge control form	Examination

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
ON 1 Possess intercultural and communicative competence, apply skills of independent continuation of further education and build professional relationships in pedagogical and social activities; purposefully use means and methods that ensure the preservation and strengthening of health in professional activities.
ON 2 To collect and interpret information for the formation of knowledge taking into account social, ethical and scientific considerations, critically evaluate their values, attitudes, ethical principles and teaching methods, set new goals for their own pedagogical development.
ON 4 Understand the psychological and pedagogical problems of teaching and educating students with disabilities in inclusive education, take into account the diverse abilities of students in the learning process, ethically support their psychological well-being in the life and educational context.
Learning outcomes by discipline
ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.
Prerequisites
Pedagogical practice
Postrequisites
Final examination

Optics

Discipline cycle	Profiling discipline
Course	2
Credits count	6
Knowledge control form	Examination

Short description of discipline
While studying this discipline, students become familiar with the basic phenomena, laws and patterns in detail. geometric (beam), wave and quantum optics. Students learn to apply the acquired theoretical knowledge in discipline in practice in their field of work, in particular when solving problems of varying complexity, conducting research experiments, independent analysis of optical phenomena occurring in nature.
Purpose of studying of the discipline
To present a physical theory as a generalization of observations of practical experience and experiments, presented at the appropriate mathematical level and using the description of electromagnetic waves within the framework of Maxwell s theory using appropriate qualitative quantum concepts.
Learning Outcomes
ON 7 Demonstrate strong academic and practical knowledge in the field of physics, operate with forms and methods of scientific knowledge, various ways of mastering the surrounding world, understand the role of science in the development of society.
ON 8 To conduct scientific research in the chosen field of experimental and theoretical physical research with the help of modern instrumentation and information technology, taking into account domestic and foreign experience.
ON 9 Apply modern methods of processing, analysis and synthesis of physical information in their chosen field of physical research, operate with basic mathematical concepts and operations and are able to apply them in solving physical problems, implement analytical and technological solutions in the field of experimental and theoretical physics.
Learning outcomes by discipline
use theoretical knowledge in explaining the results of experiments, apply knowledge in the field of physics to master general professional disciplines and solve professional problems, assess the reliability of the obtained solution of the problem; evaluate various methods of solving the problem and choose the optimal one.
ON3 Use fundamental knowledge of physics in solving basic problems of physics, physical phenomena, in explaining basic physical terms, quantities, their mathematical expression and units of measurement.
ON4 Conducting experiments on classical branches of physics, comprehensively solving typical problems using physical terms. Creation of an algorithm for the structure of physical problems, competent formulation of proofs.
Prerequisites
Electricity and magnetism
Postrequisites
Optics Astronomy

Workshop on molecular physics and thermodynamics

Discipline cycle	Profiling discipline
Course	2
Credits count	3
Knowledge control form	Examination

Short description of discipline
This chapter examines the basic laws, topics, and problems of molecular physics. Forms in students basic thinking and retention skills when performing and solving problems. An important step is the ability to decide problems based on various aggregate states of matter, as well as microscopic structure, influence of external factors (temperature, pressure, volume), chemical and physical properties of various substances.

Purpose of studying of the discipline
The purpose of the discipline is to teach how to apply theoretical knowledge in the field of molecular physics, as well as the laws of molecular physics for solving practical problems

Learning Outcomes
ON 7 Demonstrate strong academic and practical knowledge in the field of physics, operate with forms and methods of scientific knowledge, various ways of mastering the surrounding world, understand the role of science in the development of society.
ON 8 To conduct scientific research in the chosen field of experimental and theoretical physical research with the help of modern instrumentation and information technology, taking into account domestic and foreign experience.

Learning outcomes by discipline
1. must know:
- the physical foundations of phenomena related to the atomic-corpuscular structure of matter; - basic laws of thermodynamics, methods of thermodynamic and statistical description
of multiparticle systems;
2. must be able to:
- apply statistical and thermodynamic methods to the description of phenomena related to
the atomic-corpuscular structure of matter; - to use methods of physical research to study thermodynamic processes;
3. must possess:
- calculation skills within the framework of thermodynamic and statistical methods of description; - skills of working with educational and scientific literature.
ON 7 Apply modern information and communication technologies in the educational process and develop
didactic materials, virtual experiments and demonstrations in physics.
ON 8 Develop the ability for theoretical and experimental research in the chosen field of physics, take into account
modern trends in the development of physics in their professional activities

Prerequisites
Molecular physics

Postrequisites
Physics of the atom, atomic nucleus and solid body

Inclusive educational environment

Discipline cycle	Basic disciplines
Course	3
Credits count	4
Knowledge control form	Examination

Short description of discipline
Understanding and the ability to take into account the diversity of students in the learning/ teaching process, in a reasonable way, psychologically and ethically maintain well-being, taking into account the context of their lives. Students can: • Embrace diversity, identify barriers to participation and learning • identify development priorities, plan activities for the adaptation of educational programs, the development of differentiated lessons.

Purpose of studying of the discipline
The main goal of studying the discipline is to teach future specialists the principles and methods of inclusive education, as well as to develop students' skills in accepting and supporting diversity in the educational process.

Learning Outcomes
ON 1 Possess intercultural and communicative competence, apply skills of independent continuation of further education and build professional relationships in pedagogical and social activities; purposefully use means and methods that ensure the preservation and strengthening of health in professional activities.
ON 2 To collect and interpret information for the formation of knowledge taking into account social, ethical and scientific considerations, critically evaluate their values, attitudes, ethical principles and teaching methods, set new goals for their own pedagogical development.
ON 4 Understand the psychological and pedagogical problems of teaching and educating students with disabilities in inclusive education, take into account the diverse abilities of students in the learning process, ethically support their psychological well-being in the life and educational context.

Learning outcomes by discipline
pedagogy, didactics and increasing the competence of teachers working environment. Students are empowered to understand and embrace student diversity in their learning/teaching processes, supporting intellectual and ethical well-being while taking into account the context of their lives and studies. Students:
** identify barriers to diversity acceptance, inclusion and learning in schools.*
** determines development priorities and plans activities to support diversity (adaptation of educational programs, development of differentiated lessons).*
- to collect and interpret information for the formation of knowledge, taking into account social, ethical and scientific considerations, critically evaluate their values, attitudes, ethical principles and teaching methods, set new goals for their own pedagogical development
- ritically select theoretical knowledge based on advanced concepts of pedagogical education using various information and communication technologies and use the knowledge to improve the skills of teaching mathematics and their own professional growth

- o recognize and understand fundamental scientific concepts that have fundamental methodological and theoretical significance for understanding and mastering natural and mathematical sciences, to argue their own position of applying and integrating knowledge from other fields of sciences to solve global and local problems of mathematical education

Prerequisites

Age and physiological features of children s development

Postrequisites

Basic and profile disciplines of the EP

Methods of teaching physics: private issues

Discipline cycle	Basic disciplines
Course	3
Credits count	5
Knowledge control form	Examination

Short description of discipline

Teaching the discipline ensures that students master the basic methods and techniques of teaching physics, based on the study of the structure and content of the scientific and pedagogical foundations of the physics course in general education schools. During the course of studying the discipline, students learn to draw up a curriculum for the subject, select materials for different
methods depending on the type of educational process, the ability to apply methodological approaches, teach students to solve objectives.

Purpose of studying of the discipline

Teaching the discipline ensures that students master the basic methods and techniques of teaching physics, based on the study of the structure and content of the scientific and pedagogical foundations of the physics course in general education schools. During the course of studying the discipline, students learn to draw up a curriculum for the subject, select materials for different
methods depending on the type of educational process, the ability to apply methodological approaches, teach students to solve learning objectives.

Learning Outcomes

ON 2 To collect and interpret information for the formation of knowledge taking into account social, ethical and scientific considerations, critically evaluate their values, attitudes, ethical principles and teaching methods, set new goals for their own pedagogical development.

Learning outcomes by discipline

Students:
** selection of suitable pedagogical models for their training*
** creative and varied use of teaching methods, taking into account the opportunities provided by technology*
** use a suitable learning environment for teaching * knowledge and application of copyright and data protection rules and principles*
ON2 Apply modern technologies of training and criterion-based assessment, taking into account individual, physiological
and psychological characteristics of students

Prerequisites

Methods of teaching physics: private issues

Postrequisites

Methods of teaching physics: private issues

Assessment and development

Discipline cycle	Basic disciplines
Course	3
Credits count	4
Knowledge control form	Examination

Short description of discipline

Preparing physics teachers with competencies in new areas that meet modern challenges in the field of education and are necessary for teachers of the 21st century who live and work in a world of variability, uncertainty, complexity, ambiguity.

Purpose of studying of the discipline

increasing pedagogical competence in the field of pedagogy and didactics. Students have the necessary knowledge in the field of didactics, teaching technology, methods of motivation in learning and can provide pedagogical assistance, have the skills to individualize learning, taking into account the diversity of students and the use of learning technologies based on teaching and pedagogical methods. independent research. Students
understands the requirements of competence, entrepreneurship and sustainable development in their pedagogical and subject area;
** recognizes and understands educational programs in his specialty;*
** can plan and anticipate other situations that affect learning;*
** can use the educational program when planning and conducting training;*
** can apply principles of personalized learning and leadership, respond to students needs and support their personal development and self-esteem.*

Learning Outcomes

ON 3 Critically select theoretical knowledge based on advanced concepts of physics with the help of various information and communication technologies and use the knowledge to improve physics education and their own professional growth.
ON 5 To recognize and understand fundamental scientific concepts that have fundamental methodological and theoretical significance for understanding and mastering the physical sciences, to argue their own position of applying and integrating knowledge from other fields of sciences to solve global and local problems of physics.
ON 11 Work in interdisciplinary teams, have the skills to apply scientific knowledge in solving social problems.

Learning outcomes by discipline

Prerequisites

Assessment and development

Postrequisites
Assessment and development

Workshop on electricity and magnetism

Discipline cycle	Profiling discipline
Course	3
Credits count	3
Knowledge control form	Examination

Short description of discipline
The study of electricity and magnetism is part of the course of general physics. It studies electrical and magnetic phenomena found in nature, and elucidates the essence of these phenomena is based on the basic principles of philosophy, thanks to which a materialistic worldview is formed. Physical laws of electrical and magnetic phenomena serve for the benefit of humanity, and are used in solving practical problems that are significant for science, production and economic activity. Electrical and magnetic phenomena, their laws that underlie many technological production processes are widely used in the use of subsoil for the needs of mankind and for their research.

Purpose of studying of the discipline
The workshop on solving problems on electricity and magnetism is to convey to the student - future physics teacher - the doctrine of electricity and magnetism in the logical sequence of the theory of these phenomena and processes, in connection with other branches of physics, explaining in detail the physical laws in practical application.

Learning Outcomes
ON 7 Demonstrate strong academic and practical knowledge in the field of physics, operate with forms and methods of scientific knowledge, various ways of mastering the surrounding world, understand the role of science in the development of society.
ON 8 To conduct scientific research in the chosen field of experimental and theoretical physical research with the help of modern instrumentation and information technology, taking into account domestic and foreign experience.
ON 9 Apply modern methods of processing, analysis and synthesis of physical information in their chosen field of physical research, operate with basic mathematical concepts and operations and are able to apply them in solving physical problems, implement analytical and technological solutions in the field of experimental and theoretical physics.

Learning outcomes by discipline
Course Barysynda Bolashak mugalimder fizikalyk kubylystarmen zhane electromagnetism zandarymen tanysady. Olar praktikalyk esepterdi šeshů ůshin elektromagnettik kubylystardyn physikalyk modelderin tuzhyrymdauga, kurastyruga zhane koldana magnitik beret kasibi kuzyretter men Gdylardy damytada. Electromagnetism will not be affected by the heat of the ice.

Prerequisites
Physical practice 1

Postrequisites
Workshop on electricity and magnetism

Physics of the atom, atomic nucleus and solid body

Discipline cycle	Profiling discipline
Course	3
Credits count	6
Knowledge control form	Examination

Short description of discipline
The subject is a basic discipline and is intended to develop students dialectical understanding and scientific vision of the picture of the world, the formation of knowledge about modern physics and the ability to apply it in practice. Basics Course content: quantum concepts of the atom, corpuscular wave dualism, Louis de Broglie hypothesis, relation Heisenberg uncertainties, Schrödinger formula, structure of the atom and atomic nucleus, thermonuclear fusion, quantum solid state physics

Purpose of studying of the discipline
The purpose of studying the subject: to form in students a dialectical understanding of the scientific description (picture) of the world and scientific approach, teach students to use advanced laws of physics, classical theories to solve practical tasks, to develop their knowledge of modern physics and flexibility in their practical application, as well as providing education at the level of mastering methods of physical research as the main system of professional specialties.

Learning Outcomes
ON 7 Demonstrate strong academic and practical knowledge in the field of physics, operate with forms and methods of scientific knowledge, various ways of mastering the surrounding world, understand the role of science in the development of society.
ON 8 To conduct scientific research in the chosen field of experimental and theoretical physical research with the help of modern instrumentation and information technology, taking into account domestic and foreign experience.
ON 9 Apply modern methods of processing, analysis and synthesis of physical information in their chosen field of physical research, operate with basic mathematical concepts and operations and are able to apply them in solving physical problems, implement analytical and technological solutions in the field of experimental and theoretical physics.

Learning outcomes by discipline
During the course, future teachers will learn the basics of a theoretical description of the properties of atomic nuclei. They will learn about methods for describing the properties of elementary particles and interactions. Future teachers will become familiar with modern models of the formation of the Universe and the evolution of stars. They will gain practical skills in calculating the properties of atomic nuclei and particles. They also learn basic practical calculations in atomic and nuclear physics.
ON3 Use fundamental knowledge of physics when solving basic problems of physics, physical phenomena, explanations of basic physical terms, quantities, their mathematical expression and units of measurement.
ON4 Conducting experiments in classical branches of physics, comprehensively solving typical problems using physical terms. Creation of an algorithm for the structure of physical problems, competent formulation of proofs

Prerequisites

Electricity and magnetism

Postrequisites

Workshop on the physics of the atom and atomic nucleus.

Pedagogical methods

Discipline cycle	Basic disciplines
Course	3
Credits count	6
Knowledge control form	Total mark on practice

Short description of discipline

The content of psychological and pedagogical practice is aimed at forming an idea about the peculiarities 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 directions of the teacher`s activities, 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, 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

ON 1 Possess intercultural and communicative competence, apply skills of independent continuation of further education and build professional relationships in pedagogical and social activities; purposefully use means and methods that ensure the preservation and strengthening of health in professional activities.

ON 2 To collect and interpret information for the formation of knowledge taking into account social, ethical and scientific considerations, critically evaluate their values, attitudes, ethical principles and teaching methods, set new goals for their own pedagogical development.

ON 4 Understand the psychological and pedagogical problems of teaching and educating students with disabilities in inclusive education, take into account the diverse abilities of students in the learning process, ethically support their psychological well-being in the life and educational context.

Learning outcomes by discipline

Будущие учителя осваивают навыки поиска и критического отбора теоретических знаний из множества достоверных источников, используя результаты научных исследований в развитии своего педагогического мышления и практики. Демонстрирует готовность обеспечить научно обоснованную подготовку и образование, а также способствовать собственному постоянному развитию и профессиональному росту.

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

Prerequisites

Pedagogical practice

Postrequisites

Pedagogical methods

Advanced foreign language

Discipline cycle	Basic disciplines
Course	3
Credits count	4
Knowledge control form	Examination

Short description of discipline

Detailed reports on the subject. News and reports. Articles and reports on contemporary issues, modern fiction. Actively participate in a discussion on a familiar problem, explaining and defending your opinion. The statement of all the arguments "for" and "against" on the actual problem. Writing essays, reports, letters highlighting particularly important events and impressions.

Purpose of studying of the discipline

Improving the initial level of foreign language proficiency, the formation of a sufficient level of social and communicative competence of students in the cultural and professional spheres achieved at the previous stage of education.

Learning Outcomes

ON 1 Possess intercultural and communicative competence, apply skills of independent continuation of further education and build professional relationships in pedagogical and social activities; purposefully use means and methods that ensure the preservation and strengthening of health in professional activities.

ON 9 Apply modern methods of processing, analysis and synthesis of physical information in their chosen field of physical research, operate with basic mathematical concepts and operations and are able to apply them in solving physical problems, implement analytical and technological solutions in the field of experimental and theoretical physics.

Learning outcomes by discipline

ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, and apply information technologies taking into account current trends in the development of society.

ON9 To conduct experiments in the field of classical sections of physics, to describe research methods in physics. ON10 To carry out pedagogical, research and educational work.

1. possess intercultural and communicative competence, apply skills of independent continuation of further education and build professional relationships in pedagogical and social activities; purposefully use means and methods that ensure the preservation and strengthening of health in professional activities

2. apply IT to expand one s own worldview of modern society and develop demonstration experiments and practical works, use CLIL technologies for subject-language teaching of natural subjects, expanding students intercultural knowledge to develop tasks for the development of analytical and critical thinking

Prerequisites
Foreign language
Postrequisites
Basic and profile disciplines of the EP

A workshop on optics

Discipline cycle	Profiling discipline
Course	3
Credits count	3
Knowledge control form	Examination

Short description of discipline
In the course of studying the discipline, students develop skills in the practical application of theoretical knowledge acquired aware of optics.
When studying the discipline, students become familiar with the laws of geometric optics, learn to draw images in optical systems, apply the concepts of photometry. understands the physical meaning of phenomena reflecting the wave nature light, applies in practice the basic laws of wave optics, forms scientific views on the microworld by solving problems of quantum optics.
Purpose of studying of the discipline
Students obtain skills for independent work, which involves studying specific algorithms, tools and means necessary to solve optics problems;
Learning Outcomes
ON 7 Demonstrate strong academic and practical knowledge in the field of physics, operate with forms and methods of scientific knowledge, various ways of mastering the surrounding world, understand the role of science in the development of society.
ON 8 To conduct scientific research in the chosen field of experimental and theoretical physical research with the help of modern instrumentation and information technology, taking into account domestic and foreign experience.
ON 9 Apply modern methods of processing, analysis and synthesis of physical information in their chosen field of physical research, operate with basic mathematical concepts and operations and are able to apply them in solving physical problems, implement analytical and technological solutions in the field of experimental and theoretical physics.
Learning outcomes by discipline
use theoretical knowledge when explaining the resultsof the experiments, apply knowledge inthe field of physics to masteringgeneral professionaldisciplines and solvingprofessional problems.
ON3 Use fundamental knowledge of physics when solving basic problems of physics, physical phenomena, when explaining basic physical terms, quantities, their mathematical expression and units of measurement.
ON4 Develop electronic learning materials in specialized environments or based on existing electronic libraries using specialized packages
Prerequisites
Electricity and magnetism
Postrequisites
A workshop on optics

Workshop on the physics of the atom and atomic nucleus.

Discipline cycle	Profiling discipline
Course	4
Credits count	3
Knowledge control form	Examination

Short description of discipline
The physics of the atom and the atomic nucleus is designed to form students` dialectical understanding and scientifc vision of the picture of the world, the formation of knowledge about quantum physics. The course includes the following questions: Rutherford`s experience, Bohr`s postulates, Frank and Hertz experiments, Louis de Broglie hypothesis, atomic nucleus structure, nuclear reactions, elements of solid state physics.
Purpose of studying of the discipline
The purpose of studying the subject: to form students` dialectical understanding of the scientifc description (picture) of the world and the scientifc approach, to teach students to use the advanced laws of physics, classical theories to solve practical problems, to form their knowledge of modern physics and fexibility in their practical application, as well as providing education at the level of mastering the methods of physical research as the main system of a professional specialty.
Learning Outcomes
ON 7 Demonstrate strong academic and practical knowledge in the field of physics, operate with forms and methods of scientific knowledge, various ways of mastering the surrounding world, understand the role of science in the development of society.
ON 8 To conduct scientific research in the chosen field of experimental and theoretical physical research with the help of modern instrumentation and information technology, taking into account domestic and foreign experience.
ON 9 Apply modern methods of processing, analysis and synthesis of physical information in their chosen field of physical research, operate with basic mathematical concepts and operations and are able to apply them in solving physical problems, implement analytical and technological solutions in the field of experimental and theoretical physics.
Learning outcomes by discipline
During the course, future teachers acquire the skills of experimental study of the main problems of atomic and nuclear physics using modern multifunctional laboratory complexes. Computer modeling is used to implement Rutherford s experiment on the scattering of alpha particles in atoms, to study Compton scattering and a number of other phenomena.
During the course, future teachers acquire the skills of experimental study of the main problems of atomic and nuclear physics using modern multifunctional laboratory complexes. Computer modeling is used to implement Rutherford s experiment on the scattering of alpha particles in atoms, to study Compton scattering and a number of other phenomena.

Prerequisites
Electricity and magnetism
Postrequisites
Workshop on the physics of the atom and atomic nucleus.