

The list of academic disciplines of the university component

7M01 - Pedagogical sciences

(Code and classification of the field of education)

7M015 - Training of teachers in Natural science subjects

(Code and classification of the direction of training)

0114

(Code in the International Standard Classification of Education)

M011 - Training of physics teachers (kazakh, russian, english language)

(Code and classification of the educational program group)

7M01502 - Physics

(Code and name of the educational program)

Master

(Level of preparation)

set of 2024

Developed

Developed

By the Academic Committee of the EP

Head of AC Ospanova D.M.

EP Manager Zheldybayeva B.S.

Reviewed

At a meeting of the Academic Quality Commission of the Faculty Graduate School of Physical and Mathematical Sciences

Protocol No3 "09" _01_ 2024

At a meeting of the Academic Quality Commission
of the Higher School of Physical and Mathematical Sciences

Recommended for approval by the Academic Council of the University

Protocol No.1 «06» june 2024

Approved

at a meeting of the University Academic Council by protocol No. 6/1 of January 19, 2024.

at a meeting of the University Academic Council by protocol No. 11 of June 28, 2024.

Foreign language (professional)

Discipline cycle	Basic disciplines
Course	1
Credits count	3
Knowledge control form	Examination

Short description of discipline

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

Purpose of studying of the discipline

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

Learning Outcomes

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

Learning outcomes by discipline

- to know the specifics of oral and written speech in the fields of professional, scientific, socio-political relations;
 - to know the national and cultural peculiarities of the creation and organization of a text in a foreign language within the framework of professionally motivated conditions;
 - to know the stylistic features of the vocabulary of a foreign language in the field of professional communication;
- be able to perform:
- implementation of professional activity in linguistic, sociolinguistic, information-analytical and communicative aspects;
 - creating your own verbal and non-verbal order in the fields of professional and scientific socio-political relations;
 - the use of a variety of language and speech means adequate to social factors, communication conditions, the status of the interlocutor and his communicative intentions;
 - be able to organize speech activity as a representative of another culture and the nature of communication in accordance with the tasks of communication, the speech situation, individual characteristics;
- the presence of skills:
- to perceive by ear and understand the appropriate level of messages of a business, informational and vocational nature;
 - dialogical and monological communication within the framework of professional activity;
 - to get acquainted and study business and scientific and technical documentation, which provides for obtaining information from what has been read and using it in speech;
 - has the skills of systematic presentation of thoughts, thinking, information when writing letters of an official, professional nature;

Prerequisites

Bachelor

Postrequisites

Final examination

History and philosophy of science

Discipline cycle	Basic disciplines
Course	1
Credits count	5
Knowledge control form	Examination

Short description of discipline

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

Purpose of studying of the discipline

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

Learning Outcomes

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

Learning outcomes by discipline

be able to apply fundamental scientific, pedagogical, managerial, and communicative knowledge and skills in professional activities

Prerequisites

Bachelor

Postrequisites

Final examination

Higher Education Pedagogy

Discipline cycle	Basic disciplines
Course	1
Credits count	3
Knowledge control form	Examination

Short description of discipline

The course is aimed at studying the main directions, principles and patterns of higher education. During the course of the course, the

basic concepts of modern pedagogy, concepts and theories of teaching and upbringing, didactics of higher education will be considered. The master's student will master the skills of designing the organization of the educational process, techniques of individual and group reflection, will be able to correctly formulate pedagogical goals, apply educational technologies in the educational process. in the process, to design work programs of disciplines.

Purpose of studying of the discipline

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

Learning Outcomes

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

Learning outcomes by discipline

- Be able to solve the problems of higher pedagogical education and the prospects for its further development;
- Have the skills to consider the application of effective university technologies;
- Solve topical and psychological and pedagogical problems,

Prerequisites

Bachelor

Postrequisites

Pedagogical practice

Psychology of management

Discipline cycle	Basic disciplines
Course	1
Credits count	3
Knowledge control form	Examination

Short description of discipline

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

Purpose of studying of the discipline

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

Learning Outcomes

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

Learning outcomes by discipline

- be able to determine the forms and methods of effective team management;
- develop plans for the development of organizations, provide psychological support for the activities of organizations;
- possess methods of solving managerial tasks.

Prerequisites

Bachelor

Postrequisites

Pedagogical practice

Actual problems of modern physics

Discipline cycle	Profiling discipline
Course	1
Credits count	5
Knowledge control form	Examination

Short description of discipline

Actual problems of modern physics and ways to solve them, as well as the world level of natural science and the current state of physics and cognitive features of physics at the beginning of the 21st century, system principles, the structure of laws and mechanisms for the evolution of complex systemic and space-time structures, their complexity, morphogenesis and matter to be able to apply the conditions of self-development, predictable conditions of physical processes.

Purpose of studying of the discipline

- "Actual problems of modern physics" in the XX-XXI centuries in the field of physics of systemic education are solved by deep scientific trajectories of undergraduates, cognitive levels and their professional levels;
- the emerging methodological foundations of research work in various scientific areas and the training of specialists capable of solving multifaceted practical problems;
- in a special course draws the attention of undergraduates to the most general concepts, laws and principles of physics, allows them to discuss and implement physical processes and phenomena;

Learning Outcomes

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

ON3 Carry out independent scientific research in the field of educational psychology, methods of teaching physics

ON4 Demonstrate the developmental knowledge and understanding gained at the higher education level that is the basis of original development

Learning outcomes by discipline

As a result of studying the discipline, the master should know:

- to master the course, undergraduates must have knowledge of the philosophy of science, functional electronics, quantum radiophysics, theoretical, mathematical, statistical physics;

Know:

The world level of development of natural science and the current situation in physics and the cognitive features of physics at the beginning of the 21st century, system principles, the construction of patterns and mechanisms for the evolution of complex systemic and space-time structures, their difficulties, morphogenesis and conditions for the self-development of matter, knowledge of the conditions, mathematical apparatus, training and their application;

Be capable of:

- formation of a systematized network of terms and concepts that make up a working dictionary and conceptual base of modern physics;

Have skills:

- formation of professional and practical qualifications and skills of teaching physics in general education and secondary specialized educational institutions using modern methods;

- work with modern literature;

- be able to design their own and others` sensitivity, drawing physical systems, physical signs and used logical boundaries of assessments;

Prerequisites

Bachelor

Postrequisites

Modification of crystals in solid state physics Relativistic quantum theory of particle motion and radiation

Research activities of students in the study of physic

Discipline cycle Profiling discipline

Course 1

Credits count 5

Knowledge control form Examination

Short description of discipline

The essence of physics is necessary for practical application, for the study of other disciplines, for lifelong education in the system of lifelong education, through the acquisition of specific physical knowledge, its role in the development of human civilization, scientific and technological progress, modern science and production, and the growing importance of physical education in the formation of the spiritual environment of the younger generation, the development of its intellectual and other qualities.

Purpose of studying of the discipline

- preparation of specialists who can solve the methodological bases of scientific research work and multifaceted practical important problems arising in various scientific directions;

- in a special course, the attention of undergraduates is drawn to the most general concepts, laws and principles of physics, they are taught to discuss physical processes and phenomena, and create an opportunity to implement them;

- the methodological foundations of research work in physics play a key role in forming a holistic view of undergraduates on the current physical image of the world;

- the methodological foundations of scientific research work are the highest level of the unified system of physical education specific to physics, therefore, continuity with the general physics course is required.

Learning Outcomes

ON2 Practice various forms and methods of active teaching of physics to integrate the most effective modern educational technologies into the methods of teaching physics in universities.

ON5 Classify physical phenomena and their corresponding theoretical models, evaluate the effectiveness of their application; describe the physical processes of the general physics course, draw up algorithms for solving problems in the field of physics and pedagogy.

ON7 Organize the cognitive activity of students, apply the basics of the methodology of the educational process in physics in their activities.

ON8 Prepare undergraduates for conducting classes with in-depth theoretical and practical study of modern physics in general education schools and other educational institutions necessary for daily professional activities and continuing education in doctoral studies.

ON9 Conduct information-analytical and information-bibliographic work with the involvement of modern information technologies.

Learning outcomes by discipline

As a result of studying the subject, the master`s student should know:

- processing of basic nonlinear phenomena, their transition features, basic concepts, quantities, their mathematical notations, units of measurement, basics of experimental methods and measurement results;

Listening:

basic laws of nonlinear physics, their observation in nature and their use in technology, mathematical description;

To do:

- to be able to explain the fundamental concepts of physics, methodological bases of research work

- the ability to reveal the nonlinear mechanism of the phenomenon, the ability to analyze the change of physical parameters in certain specific processes;

- ability to work with tools and methods of measuring the main parameters of systems;

- mastering the technique of physical experiments on natural objects, thermodynamic parameters, constants;

- to be able to measure process characteristics, to be able to evaluate the measurement result, to be able to use a computer and to be able to obtain the result of statistical processing of the measurement result, to be able to make reports for nonlinear phenomena.

Having the skills:

- formation of physics teaching, professional- practical qualifications and skills in secondary and special secondary educational institutions using modern methods;

- ability to work with scientific literature

- to be able to work with physical devices, to improve these devices, to make experimental calculations and connect them with the laws of physics, to be able to conduct scientific research work;

Prerequisites

Methods of teaching physics with elements of folk pedagog Methods of teaching physics with elements of folk pedagogy Using elements of folk pedagogy in physics at secondary school

Postrequisites

Methods of teaching content of updated content in the secondary education system The content of the renewed physics in the

educational system of higher education The method of forming fundamental concepts in solving physics problems Methodology of decision of olympiad tasks on physics New educational technologies in the process of teaching physics The problems of maintaining updated physics in the educational system of higher education Methodology of decision of experimental tasks on physics Ways to use learning technologies in physics

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

Discipline cycle	Profiling discipline
Course	1
Credits count	11
Knowledge control form	Total mark on practice

Short description of discipline

Goals and objectives of the research work of the undergraduate. The quality of the organization of research work undergraduate. The main directions of the preparation of research work. Types and forms of research work of undergraduates. The results of the research work of the undergraduate. Monitoring the implementation of the research work of the undergraduate. Methods and techniques for conducting research work undergraduates

Purpose of studying of the discipline

Research work in the semester is one of the main types of independent work of a master student, the main result of which is the writing and successful defense of a master's thesis and, first of all, forming the professional competencies of a master

Learning Outcomes

ON2 Practice various forms and methods of active teaching of physics to integrate the most effective modern educational technologies into the methods of teaching physics in universities.

ON5 Classify physical phenomena and their corresponding theoretical models, evaluate the effectiveness of their application; describe the physical processes of the general physics course, draw up algorithms for solving problems in the field of physics and pedagogy.

ON7 Organize the cognitive activity of students, apply the basics of the methodology of the educational process in physics in their activities.

ON8 Prepare undergraduates for conducting classes with in-depth theoretical and practical study of modern physics in general education schools and other educational institutions necessary for daily professional activities and continuing education in doctoral studies.

ON9 Conduct information-analytical and information-bibliographic work with the involvement of modern information technologies.

Learning outcomes by discipline

- Assessment of the accuracy, reliability and reliability of data, as well as their sufficiency;
- Mastering the theoretical foundations of the organization of research activities;
- Mastering the principles of using modern educational and research technologies in professional activities;
- Ability to analyze trends in the development of physics and identify promising areas of scientific research;
- Apply practical and theoretical research methods in professional activities;
- Possess modern methods and techniques for collecting, processing and analyzing scientific information;

Prerequisites

Methods of teaching physics with elements of folk pedagogy Methods of teaching physics with elements of folk pedagogy Using elements of folk pedagogy in physics at secondary school

Postrequisites

Methods of teaching content of updated content in the secondary education system The content of the renewed physics in the educational system of higher education The method of forming fundamental concepts in solving physics problems Methodology of decision of olympiad tasks on physics New educational technologies in the process of teaching physics Methods of teaching physics using new technologies

Pedagogical practice

Discipline cycle	Basic disciplines
Course	2
Credits count	6
Knowledge control form	Total mark on practice

Short description of discipline

Pedagogical practice provides for: preparation of a lecture on a topic determined by the head of the practice and corresponding to the direction of the scientific interests of the undergraduate. Reading trial lectures is recommended only in small student groups under the supervision of a teacher on topics related to his research work; conducting seminars and practical classes within the framework of a complex of disciplines read by teachers of the departments.

Pedagogical practice provides general professional training in terms of preparing graduate students for teaching positions in universities. The pedagogical practice of graduate students consists in mastering the practical skills of conducting training sessions in higher educational institutions. The practice of postgraduate students is carried out within the framework of the general concept of training masters, and during the practice, it is envisaged to perform experimental work on the topic of the dissertation. In addition, they learn to involve students in educational and scientific work

Purpose of studying of the discipline

The purpose of the practice is to deepen, improve and consolidate the received theoretical knowledge, to be able to use them in pedagogical activity

Learning Outcomes

ON2 Practice various forms and methods of active teaching of physics to integrate the most effective modern educational technologies into the methods of teaching physics in universities.

ON5 Classify physical phenomena and their corresponding theoretical models, evaluate the effectiveness of their application; describe the physical processes of the general physics course, draw up algorithms for solving problems in the field of physics and pedagogy.

ON7 Organize the cognitive activity of students, apply the basics of the methodology of the educational process in physics in their activities.

ON8 Prepare undergraduates for conducting classes with in-depth theoretical and practical study of modern physics in general education

schools and other educational institutions necessary for daily professional activities and continuing education in doctoral studies.
ON9 Conduct information-analytical and information-bibliographic work with the involvement of modern information technologies.

Learning outcomes by discipline

Manages collective teams, uses modern methods of motivation, communicates in crisis situations, quality control and integrated management, application of knowledge of the theoretical foundations and technologies for teaching physics and astronomy, implementation of methodological support for the educational process

Prerequisites

Modern methods of teaching general physics course Physical concept formation technique Credit technology in teaching physics Research activities of students in the study of physics

Postrequisites

Practice research

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

Discipline cycle	Profiling discipline
Course	2
Credits count	4
Knowledge control form	Total mark on practice

Short description of discipline

The goals and objectives of the research work of a student. The quality of the organization of research work undergraduate. The main directions of preparation of research work. The types and forms of research work of a student. Results of research work of the undergraduate. Monitoring of implementation of scientific - research work of a student. Methods and techniques for conducting research work of a student.

Purpose of studying of the discipline

Research work in the semester is one of the main types of independent work of a master student, the main result of which is the writing and successful defense of a master's thesis and, first of all, forming the professional competencies of a master

Learning Outcomes

ON2 Practice various forms and methods of active teaching of physics to integrate the most effective modern educational technologies into the methods of teaching physics in universities.

ON5 Classify physical phenomena and their corresponding theoretical models, evaluate the effectiveness of their application; describe the physical processes of the general physics course, draw up algorithms for solving problems in the field of physics and pedagogy.

ON7 Organize the cognitive activity of students, apply the basics of the methodology of the educational process in physics in their activities.

ON8 Prepare undergraduates for conducting classes with in-depth theoretical and practical study of modern physics in general education schools and other educational institutions necessary for daily professional activities and continuing education in doctoral studies.

ON9 Conduct information-analytical and information-bibliographic work with the involvement of modern information technologies.

Learning outcomes by discipline

- Assessment of the accuracy, reliability and reliability of data, as well as their sufficiency;
- Mastering the theoretical foundations of the organization of research activities;
- Mastering the principles of using modern educational and research technologies in professional activities;
- Ability to analyze trends in the development of physics and identify promising areas of scientific research;
- Apply practical and theoretical research methods in professional activities;
- Possess modern methods and techniques for collecting, processing and analyzing scientific information;

Prerequisites

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

Postrequisites

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

Practice research

Discipline cycle	Profiling discipline
Course	2
Credits count	13
Knowledge control form	Total mark on practice

Short description of discipline

The course studies: the basic concepts used in the study of learning processes and the mathematical processing of their results in academic disciplines: in the object, in subjects, in tasks and in expected results. The main categories and keywords in the specialty and collaborative words in the field of pedagogical sciences. The study of scientific research on the categories of foreign words. Keywords of the most recent publications, most read, most cited, trending publications

Purpose of studying of the discipline

The purpose of the research practice is to develop undergraduate skills and abilities to competently conduct scientific research in the chosen direction, use scientific methods in conducting research, analyze, generalize and use the results obtained

Learning Outcomes

ON2 Practice various forms and methods of active teaching of physics to integrate the most effective modern educational technologies into the methods of teaching physics in universities.

ON5 Classify physical phenomena and their corresponding theoretical models, evaluate the effectiveness of their application; describe the physical processes of the general physics course, draw up algorithms for solving problems in the field of physics and pedagogy.

ON7 Organize the cognitive activity of students, apply the basics of the methodology of the educational process in physics in their activities.

ON8 Prepare undergraduates for conducting classes with in-depth theoretical and practical study of modern physics in general education schools and other educational institutions necessary for daily professional activities and continuing education in doctoral studies.

ON9 Conduct information-analytical and information-bibliographic work with the involvement of modern information technologies.

Learning outcomes by discipline

Analyzes the results of scientific work;

Applies research methods in the master's thesis;

Identifies a scientific problem

ON2 Practice various forms and methods of active teaching of physics to integrate the most effective modern educational technologies into the methods of teaching physics in universities

ON5 Classify physical phenomena and their corresponding theoretical models, evaluate the effectiveness of their application; describe the physical processes of the general physics course, draw up algorithms for solving problems in the field of physics and pedagogy

ON7 Organize the cognitive activity of students, apply the basics of the methodology of the educational process in physics in their activities

ON8 Prepare undergraduates for conducting classes with in-depth theoretical and practical study of modern physics in general education schools and other educational institutions necessary for daily professional activities and continuing education in doctoral studies

ON9 Conduct information-analytical and information-bibliographic work with the involvement of modern information technologies

Prerequisites

Basic and profile disciplines of the EP Pedagogical practice

Postrequisites

Final examination

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

III

Discipline cycle	Profiling discipline
Course	2
Credits count	9
Knowledge control form	Total mark on practice

Short description of discipline

The goals and objectives of the research work of a student. The quality of the organization of research work undergraduate. The main directions of preparation of research work. The types and forms of research work of a student. Results of research work of the undergraduate. Monitoring of implementation of scientific - research work of a student. Methods and techniques for conducting research work of a student

Purpose of studying of the discipline

Research work in the semester is one of the main types of independent work of a master student, the main result of which is the writing and successful defense of a master's thesis and, first of all, forming the professional competencies of a master

Learning Outcomes

ON2 Practice various forms and methods of active teaching of physics to integrate the most effective modern educational technologies into the methods of teaching physics in universities.

ON5 Classify physical phenomena and their corresponding theoretical models, evaluate the effectiveness of their application; describe the physical processes of the general physics course, draw up algorithms for solving problems in the field of physics and pedagogy.

ON7 Organize the cognitive activity of students, apply the basics of the methodology of the educational process in physics in their activities.

ON8 Prepare undergraduates for conducting classes with in-depth theoretical and practical study of modern physics in general education schools and other educational institutions necessary for daily professional activities and continuing education in doctoral studies.

ON9 Conduct information-analytical and information-bibliographic work with the involvement of modern information technologies.

Learning outcomes by discipline

- Assessment of the accuracy, reliability and reliability of data, as well as their sufficiency;

- Mastering the theoretical foundations of the organization of research activities;

- Mastering the principles of using modern educational and research technologies in professional activities;

- Ability to analyze trends in the development of physics and identify promising areas of scientific research;

- Apply practical and theoretical research methods in professional activities;

- Possess modern methods and techniques for collecting, processing and analyzing scientific information;

Prerequisites

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

Postrequisites

Final examination