The list of academic disciplines of the university component

7M05 - Natural Sciences, Mathematics and Statistics
(Code and classification of the field of education)

7M053 - Physical and chemical sciences
(Code and classification of the direction of training)

0530
(Code in the International Standard Classification of Education)

M090 - Physics
(Code and classification of the educational program group)

7M05302 - Technical physics
(Code and name of the educational program)

Master
(Level of preparation)

set of 2023

Semey 2023

Developed
By the Academic Committee of the EP
The head of the AC Nurymhan G.N.
EP Manager Yermolenko M.V.

Reviewed
at the meeting of the Quality Assurance Commission of the Faculty of Engineering and Technology
Recommended for approval by the Academic Council of the University
Protocol № 4.6 "10" April 2023
Chairman of the Commission on Quality Assurance Abdilova G.

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.

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
ON 1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.
- 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;
- have 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
Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activity.

Prerequisites
Bachelor

Postrequisites
Final examination

Tertiary education

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

• Solves the problems of higher pedagogical education and the prospects for its further development;
• Considers the application of effective university technologies;
• Solves 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

- they are 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

Final examination

Selected chapters of modern physics

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

Short description of discipline

This discipline is devoted to the discussion of non-trivial and interesting physical problems of modern physics. The classical mechanics of a material point and the principle of relativity in classical physics and relativistic physics are considered. The thermodynamics of ideal and thermodynamics of real gases, statistical methods used in physics are considered. Some macroscopic quantum effects and high-temperature superconductivity are discussed. The fundamentals of atomic physics, quantum mechanics and elements of mesoscopic physics are given.

Purpose of studying of the discipline

Formation of masters` ideas about modern physics as a whole, as a logically coherent system of knowledge about the laws of Nature for the creation of new technologies and the management of technical means.

Learning Outcomes

ON6 To operate the fundamental concepts of modern physics in the field of nanotechnology, non- Newtonian fluids and energy production.
ON8 To operate information in the field of modern nuclear power plants, thermonuclear energy in matters of their safe operation and research activities.

Learning outcomes by discipline

- to interpret the basic laws of modern physics in their mutual connection;
- to explain the influence of the basic laws of modern physics on the creation of a harmonious physical science and a scientific picture of the world;
- to represent the logic of the development of physics as a system of physical principles;
- use the limits of applicability of the basic laws of physics;

- to demonstrate the prospects for the development of physics;
- to imagine how to use the existing paradigm of modern science;
- to formulate the basic laws of modern physics;
- to determine the areas of application of the basic laws of modern physics;
- use the basic methodological principles for solving physical problems;
- to generalize experimental and theoretical computational materials based on the methodology of modern physics.

Prerequisites
Bachelor

Postrequisites
Final examination

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

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

Short description of discipline
Research work develops the ability to independently carry out activities in the field of education and science related to solving complex professional tasks in innovative conditions, ensuring the development of professional research thinking of undergraduates, forming a clear understanding of their main professional tasks, ways to solve them, conducting bibliographic work with the involvement of modern information technologies.

Purpose of studying of the discipline
Preparation of a master`s student for independent research work aimed at writing and defending a master`s thesis.

Learning Outcomes
ON2 To form the strategy and structure of the organization of scientific research and physico- mathematical modeling of nuclear facilities.
ON3 To form the strategy and structure of the organization of scientific research and computer-aided design in low-potential energy.
ON4 To form the strategy and structure of the organization of scientific research in the field of measurement of ionizing radiation and mathematical methods of analysis for biomedical research.

Learning outcomes by discipline
- solve assigned tasks;
- analyze research results;
- participate in the organization of conferences and scientific seminars.

Prerequisites
Bachelor Organization and planning of scientific research

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

Pedagogical practice

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

Short description of discipline
The pedagogical practice of the undergraduate is an important practical component of the second stage of higher education. This type of practice is aimed at mastering the basics of pedagogical skills, leading a group of students and developing educational and methodological material. The passage of pedagogical practice involves the formation of concepts about modern educational technologies, forms and methods of conducting classes, monitoring the assimilation of the studied material. Pedagogical practice contributes to the development of undergraduates` self-analysis skills based on the results of the work done.

Purpose of studying of the discipline
The purpose of teaching practice is to study the basics of educational and methodical work and the formation of practical skills and methods of teaching in higher education.

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

Learning outcomes by discipline
- to determine the forms and methods of control and assessment of students` knowledge;
- build a plan for the lesson;
- to demonstrate the writing of methodological developments.

Prerequisites
Tertiary education

Postrequisites
Final examination

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
Research work develops the ability to independently carry out activities in the field of education and science related to solving complex professional tasks in innovative conditions, ensuring the development of professional research thinking of undergraduates, forming a clear understanding of their main professional tasks, ways to solve them, conducting bibliographic work with the involvement of modern information technologies.

Purpose of studying of the discipline
Preparation of a master`s student for independent research work aimed at writing and defending a master`s thesis.

Learning Outcomes
ON2 To form the strategy and structure of the organization of scientific research and physico- mathematical modeling of nuclear facilities.
ON3 To form the strategy and structure of the organization of scientific research and computer-aided design in low-potential energy.
ON4 To form the strategy and structure of the organization of scientific research in the field of measurement of ionizing radiation and mathematical methods of analysis for biomedical research.

Learning outcomes by discipline
- solve assigned tasks;
- analyze research results;
- participate in the organization of conferences and scientific seminars.

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

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

Research practice

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

Short description of discipline
The research practice of the undergraduate is conducted in order to familiarize with the latest theoretical, methodological and technological achievements of domestic and foreign science, modern methods of scientific research, processing and interpretation of experimental data and their application in further activities

Purpose of studying of the discipline
Formation of students` skills of conducting research work within the framework of a master`s thesis.

Learning Outcomes
ON2 To form the strategy and structure of the organization of scientific research and physico- mathematical modeling of nuclear facilities.
ON3 To form the strategy and structure of the organization of scientific research and computer-aided design in low-potential energy.
ON4 To form the strategy and structure of the organization of scientific research in the field of measurement of ionizing radiation and mathematical methods of analysis for biomedical research.

Learning outcomes by discipline
- to interpret the methodology for constructing the stages of scientific research;
- draw up a work plan when conducting research;
- prepare reports on the work done.

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
Final examination

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

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

Short description of discipline
Research work develops the ability to independently carry out activities in the field of education and science related to solving complex professional tasks in innovative conditions, ensuring the development of professional research thinking of undergraduates, forming a clear understanding of their main professional tasks, ways to solve them, conducting bibliographic work with the involvement of modern information technologies.

Purpose of studying of the discipline
Preparation of a master`s student for independent research work aimed at writing and defending a master`s thesis.

Learning Outcomes
ON2 To form the strategy and structure of the organization of scientific research and physico- mathematical modeling of nuclear facilities.
ON3 To form the strategy and structure of the organization of scientific research and computer-aided design in low-potential energy.
ON4 To form the strategy and structure of the organization of scientific research in the field of measurement of ionizing radiation and

mathematical methods of analysis for biomedical research.

Learning outcomes by discipline

- solve assigned tasks;
- analyze research results;
- participate in the organization of conferences and scientific seminars.

Prerequisites

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

Postrequisites

Final examination