

Ф.7.02-09

 INISTRY OF SCIENCEs AND higher EDUCATION OF THE REPUBLIC OF KAZAKHSTAN

M.Auezov South Kazakhstan State University

«APPROVED BY»

Chairman of the board -

Rector \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Doctor of historical sciences,

Аcademician, Kozhamzharova D.P. «\_\_\_»\_\_\_\_\_\_\_\_\_\_2022 .

[**Education Programme**](https://context.reverso.net/%D0%BF%D0%B5%D1%80%D0%B5%D0%B2%D0%BE%D0%B4/%D0%B0%D0%BD%D0%B3%D0%BB%D0%B8%D0%B9%D1%81%D0%BA%D0%B8%D0%B9-%D1%80%D1%83%D1%81%D1%81%D0%BA%D0%B8%D0%B9/Education%2BProgramme)

7М01520-Physics

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| --- | --- |
| [Registrationnumber](https://context.reverso.net/%D0%BF%D0%B5%D1%80%D0%B5%D0%B2%D0%BE%D0%B4/%D0%B0%D0%BD%D0%B3%D0%BB%D0%B8%D0%B9%D1%81%D0%BA%D0%B8%D0%B9-%D1%80%D1%83%D1%81%D1%81%D0%BA%D0%B8%D0%B9/Registration%2Bnumber) | - |
| Code and classification of the field of education | 7М01 Pedagogical Science |
| Code and classification of training areas | 7М015 Training of teachers in natural science |
| Group of educational programs | М 012 Training physics pedagogues  |
| Typeof EP | Acting |
| ISCE level | 7 |
| NQF level | 7 |
| SQF of education level | 7 |
| Language of learning | Kazakh, Russian |
| The complexity of the EP,  | 120 credits |
| Distinctive features of EP | - |
| University Partner ( JEP ) | - |
| University Partner ( TDEP ) | - |

Shymkent, 2022.

Drafters:

|  |  |  |
| --- | --- | --- |
| Name | Position | Sign  |
| Saidakhmetov Pulat Ablatyevich | Ph.D., Associate Professor of the Department of Physics |  |
| Abdualieva Marzhan Amiralievna | PhD., Associate Professor of the Department "Physics" |  |
| Abdraimov Rakhimzhan Turisbekovich | master, senior teacher |  |
| Spabekova Roza Spabekovna | Ph.D., Associate Professor of the Department "Physics" |  |
| Akimkul Altynai | master student of groupМЕP-21 2nk |  |
| Ormanova Gania KemalovnaHead of the Department of "Physics" of KSPU. Ph.D., | Head of the Department of "Physics" of SKSPU. . Ph.D., |  |
| Sarsenbaeva Zh.P. | Director of the school-gymnasium №50 named after A. Baitursynov |  |
| Myrzasalieva A. S. | Director South Kazakhstan Humanitarian and Economic College |  |

The EP was considered in the direction of training Pedagogy at a meeting of the academic committee, Minutes #\_\_\_ «\_\_\_\_\_» \_\_\_\_\_\_ 2022 y.

Chairman of Commission\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Urazbayev K.M.

 Sign

The EP was considered and recommended for approval at Educational-methodical meeting of M. Auezov SKU

Minutes #\_\_\_\_\_ from «\_\_\_\_» \_\_\_\_\_\_\_\_\_\_20\_\_.

Тhe EP was approved by the decision of the Academic Council of the University

Minutes # \_\_\_ from \_\_\_\_\_\_\_\_\_\_20\_\_.

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**CONCEPT OF THE PROGRAM**

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| **University mission**  | Generation of new competencies, preparation of a leader who translates research and entrepreneurial thinking and culture |
| **University values** | * Openness - open to change, innovation and cooperation.

Creativity – generates ideas, develops them and turns them into values.* Academic freedom - **free in choice, development and action.**
* Partnership - creates trust and support in relationships where everyone wins.
* Social responsibility - ready to fulfill obligations, make decisions and be responsible for their results.
 |
| **Model of graduate** | * Deep subject knowledge, its application and constant expansion in professional activities.
* Information and digital literacy and mobility in a rapidly changing environment.
* Research skills, creativity and emotional intelligence.
* Entrepreneurship, independence and responsibility for self-activity and well-being.
* Global and national citizenship, tolerance for cultures and languages.
 |
| **Uniqueness of EP** | * Orientation to the regional labor market and social order through the formation of professional competencies of the graduate, adjusted to the requirements of stakeholders.
* Practice orientation and emphasis on the development of critical thinking and entrepreneurship, the formation of a wide range of skills that will allow you to be functionally literate and competitive in any life situation and be in demand in the labor market.
 |
| **Academic Integrity and Ethics Policy** | The university has taken measures to maintain academic honesty and academic freedom, protection from any kind of intolerance and discrimination:* Rules academic honesty (protocolscientist Council No. 3 October 30, 2018 . );
* Anti-corruptionstandard (Order No. 373 н/к December 27, 2019).
* Codeethics (protocolscientistCouncil No. 8 January 31, 2020).
 |
| **Regulatory and legal framework for the development of EP** | 1. Law Republic Kazakhstan "Education";
2. Standard rules of activity of educational organizations implementing educational programs of higher and (or) postgraduate education, approved by Order of the Ministry of Education and Science of the Republic of Kazakhstan dated October 30, 2018 No. 595 with amendments and additions dated December 29, 2021 No. 614
3. State obligatory standards higher and after university education approved by order of the Ministry of Education and Science of the Republic of Kazakhstan, October 31, 2018 No. 604;
4. Rules organizations educational processon credit technology training approved by order of the Ministry of Education and Science of the Republic of Kazakhstan, April 20, 2011 No. 152;
5. Qualifying directory posts managers, professionals and other employees, approved by order Minister labor and social protection population Republic Kazakhstan, December 30, 2020 No. 553.
6. Management on using ECTS.
7. Management on developing educational programs higher and after university education , appendix 1 to the or derat directors TsBPiAM No. 45 o /д, June 30, 2021
 |
| **About the organization of educational process** | * Implementation principles Bologna process
* With a student centered education
* Availability
* Inclusiveness
 |
| **Ensuring the quality of the EP** | * In the interior systemensur equality
* Attraction of stakeholders to the development of the EP and its evaluation
* Systematic monitoring
* Content update (update)
 |
| **Requirements for applicants** | U are established in accordance with the Model Rules for Admission to Education in Educational Organizations Implementing Educational Programs of Higher and Postgraduate Education Order of the Ministry of Education and Science of the Republic of Kazakhstan, No. 600 October 31, 2018 |

**2. EP PASPORT**

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| **Purpose of the OP** | • training of highly qualified masters who have conceptual knowledge in the field of scientific and pedagogical physics and are capable of self-development and implementation in research and teaching activities. |
| **OP Tasks** | – meeting the needs of the individual in intellectual, cultural and moral development by obtaining higher postgraduate education;- training of masters, teachers of physics, capable of successfully mastering related areas of professional activity, as well as advanced training, training in additional education programs and continuing education in doctoral studies;– meeting the needs of society in qualified specialists in the field of education and teaching physics in universities that are able to integrate academic values with entrepreneurial ideas;- development of a favorable educational environment for the implementation of professional, cultural and linguistic needs of students ;– formation of a deep professional understanding of fundamental problems and practical methods for their solution in the field of physics and methods of teaching physics and its applications in scientific and pedagogical activities;- the formation of professional ability to plan and independently conduct effective scientific and pedagogical work, as well as to critically evaluate its results;- the formation of the ability to adapt and apply general methods of solution to the solution of non-standard problems;- preparation for professional activities at a university, research institute, in production or doctoral studies. |
| **Harmonization of EP** | **• 7** th level of the National Qualifications Framework of the Republic of Kazakhstan;• Dublin descriptors of the 7th level of qualification;• 2 cycle of a Framework for Qualification of the European Higher Education Area);* • 7th Level of European Qualification Framework for Life long Learning).
 |
| **Connectionof EPwith the professional sphere** | Professional standard "Teacher", approved by the order of the Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" [No. 133 dated June 8 , 2017](http://atameken.kz/uploads/content/files/%D0%9F%D1%80%D0%B8%D0%BA%D0%B0%D0%B7%20%D0%9F%D0%A1%20%D0%9F%D0%B5%D0%B4%D0%B0%D0%B3%D0%BE%D0%B3%20%E2%84%96133%20%D0%BE%D1%82%2008_06_2017.PDF) . |
| **Name of the degree awarded** | After the successful completion of this EP, the graduate is awarded the degree of Master Pedagogical " 7M01520-Physics ". Masters of ЕP 7M01520-Physics can hold the positions of assistant teacher, teacher, senior teacher of physics in universities, colleges, teacher-researcher and teacher-master in secondary and secondary specialized educational institutions, and researcher in research institutions.  |
| **Sphere of professional activity** | • area of education;• social sphere for the development of children and students; in general educational and higher educational organizations; educational institutions and centers;• scientific activity and entrepreneurship in the field of education;• the field of physics, physics in education and at work.– area of education, |
| **Objects of professional activity** | • higher, secondary and secondary specialized educational institutions (universities, colleges, technical and vocational education institutions, lyceums, school gymnasiums),• management organizations: state education authorities, departments of education;• research organizations. |
| **Subjects of professional activity** | • the educational process in the unity of its value-target guidelines, content, methods, forms and results;• scientific and pedagogical, innovative, informational and analytical activities in the field of physics and methods of teaching physics. |
| **Types of professional activity** | *• pedagogical and educational:*- organization of the educational process at different levels of the education system (organization of the process of education and upbringing, design and management of the pedagogical process, diagnostics, correction, prediction of the results of pedagogical activity);– preparation and conduct of classes in physics;- management of scientific work of students;- conducting optional classes in physics;- organization of cultural and leisure work with young students in the field of education, development of programs, methods and technologies for educational work in the field of physics and its scientific and technical achievements.*• research:*– conducting scientific research on the problems posed in the field of education;– selection of the necessary research methods;– formulation of new tasks arising in the course of scientific research;– work with scientific literature using new information technologies, tracking scientific periodicals;– analysis of the received scientific information using modern computer technology.*• scientific and innovative:*application of the results of scientific research in innovation;- development of new methods of scientific and pedagogical activity;participation in the formulation of new tasks and the development of new methodological approaches in scientific and innovative research;- processing and analysis of the received data with the help of modern information technologies.• *organizational and managerial:*- participation in the organization of research and scientific and innovative works;- participation in the organization of seminars, conferences;- preparation of abstracts, writing and registration of scientific articles;- participation in the preparation of applications for grant competitions and registration of scientific and pedagogical projects, reports and patents. |
| **Educational Outcomes** | **EO4** The ability to organize the educational process in educational institutions of higher education, research work of students in the field of education and methods of teaching physics, taking into account the peculiarities of inclusive education.**EO5** The ability to generalize and apply the results of modern research in the field of methods of teaching physics and achievements of science in teaching physics disciplines in educational institutions.**EO6** The ability to carry out teaching activities at a professional level, using innovative and digital technologies, interactive teaching methods and monitoring the progress of students.**EO1** Deeply understand modern trends in education, features of STEM - training for the development of functional literacy of students.**EO2** Effectively use psychological and pedagogical technologies in professional activities necessary for the training, development and education of students, including those with special educational needs**EO3** Conduct training sessions professionally, actively using STEM technology to develop students' life skills.**EO4** Integrate and apply science and engineering practices into teaching, learning materials and assessment, demonstrating skills in analyzing, selecting and transforming information.**EO5** Reasonable to planand manage projects at all stages of their life cycle, solving problems based on critical thinking, applying digital technologies and resources, using logical, systematic and sequential approaches**EO6** In cooperation with colleagues, plan and conduct research in the field of natural and pedagogical sciences to improve the practice of education, introducing the results of research into practical pedagogical activities.**EO7** The ability to apply modern achievements of the science of physics and education in teaching physics, describing physical processes observed in nature and in space objects.**EO8** The ability to apply numerical models of physical processes, the physical foundations of high technologies and complex physics problems in teaching physics using methods of mathematical physics.**EO9** The ability to effectively teach physics by managing the audience, promoting collaboration in a team, encouraging student voice, creativity, leadership, critical thinking and teamwork.**EO10** The ability to apply distance learning technologies in teaching physics, taking into account the achievements of the science of physics, modern educational practice and advanced pedagogical experience.**EO11** Design and implement forms and methods of quality control of education, as well as various types of controland measuring materials, based on the use of criteria-based assessment and advanced foreign teaching technologies using digital technologies. |

**3.COMPETENCES OF THE GRADUATE OF EP**

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| **SOFT SKILLS** (Behavioral skills and personality qualities) |
| SS 1. Competence in managing one's own literacy | SS1.1. Strive for professional and personal growth throughout life.SS 1.2. Constantly update own knowledge within the chosen trajectory and in an interdisciplinary environment, carry out further learning with a high degree of independence and self-regulation.SS 1.3. To be capable of reflection, an objective assessment of one's achievements, an awareness of the need to form new competencies and continue education in doctoral studies. |
| SS 2. Language competence | SS2.1. The ability of possessing a sufficient level of communication in the professional field in the state, Russian and foreign languages for negotiating and business correspondence.SS 2.2. The ability of mastering the skills of mediation and intercultural understanding. |
| SS 3. Mathematical Competence and Competence in the field of Science | SS3.1. The ability to interpret the methods of mathematical analysis and modeling for solving applied problems in the field of study.SS3.2. The ability to plan the setting of scientific experiments, integrate and implement the results of scientific research in the professional field.SS 3.3. The ability to analyze and comprehend modern methods of pedagogical and psychological science and apply them in pedagogical activity. |
| SS 4. Digital competence, technological literacy | SS 4.1. The ability to confidently use modern information and digital technologies, artificial intelligence systems for work, leisure and communications.SS 4.2. Proficiency in the use, recovery, evaluation, storage, production, presentation and exchange of information in a wide range of digital devices.SS 4.3. Ability to confidently use global information resources and apply technological literacy in research and computational and analytical activities. |
| SS 5. Personal, social and academic competencies | SS 5.1. Possession of the norms of business ethics, social and ethical values and focus on them in professional activities.SS 5.2. Formation of a personality capable of mobility in the modern world, critical thinking and physical self-improvement.SS 5.3. Ability to work in a team, correctly, clearly and reasonably defend one's position during discussions and make decisions of a professional nature.SS 5.4. Ability to adequately navigate in various social spheres of activity and in conditions of uncertainty.SS 5.5. Ability to find compromises, correlate own opinion with the opinion of the team. |
| SS 6. Entrepreneurial competence | SS 6.1. The manifestation of leadership qualities and the ability to have a positive impact on others, to lead a team.SS 6.2. The ability to create conditions for the development of creative and entrepreneurial skills of the team.SS 6.3. The ability to work in a mode of uncertainty and rapidly changing task conditions, make decisions, respond to changing working conditions, allocate resources and manage your time.SS 6.4. Ability to work with consumer needs. |
| SS 7. Cultural awareness and ability to express yourself | SS7.1. The ability to show worldview, civil and moral positions.SS7.2. The ability to be tolerant of the traditions and culture of the peoples of the world, to have high spiritual qualities. |
| **HARD SKILLS** |
| Theoretical knowledge, practical skills and abilities specific to this area | PC1 ability to independently set specific tasks of scientific research in the field of methods of teaching physics and solve them with the help of information technology and the use of the latest domestic and foreign experience. |
| PC2 the ability to apply knowledge of physics and methods of teaching physics to solve scientific and innovative problems, and apply the results of scientific research in innovative scientific and pedagogical activities. |
| PC3 ability to participate in the development of new methods and methodological approaches in scientific and innovative research and teaching activities  |
| PC4 the ability to plan, organize and conduct research, scientific seminars and conferences in the field of education and physics. |
|  | PC5 ability to prepare and execute scientific and pedagogical documentation, scientific reports, reviews, reports and articles. |
|  | PC6 ability to lead research activities of students in the field of physics and methods of teaching physics. |
|  | PC7 the ability to methodically competently build lesson plans for the sections of academic disciplines in physics and publicly present the theoretical and practical sections of these disciplines in accordance with the approved teaching AIDS. |

**3.1 Matrix mapping of learning outcomes at the EP in General, generated by the competence modules**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **EO1** | **EO2** | **EO3** | **EO4** | **EO5** | **EO6** | **EO7** | **EO8** | **EO9** | **EO10** | **EO11** |
| SS1 | + | + | + |  |  | + | + |  |  |  |  |
| SS2 | + | + | + |  |  | + | + |  | + | + |  |
| SS3 |  | + | + | + | + |  | + | + | + |  | + |
| SS4 | + | + |  | + | + |  |  |  |  |  | + |
| SS5 |  | + |  |  | + |  |  |  | + |  | + |
| SS6 |  |  | + | + | + |  |  | + | + | + |  |
| SS7 |  |  |  |  | + |  | + |  |  | + |  |
| PC1 | + | + | + |  | + |  | + | + |  |  |  |
| PC2 | + | + | + |  | + | + | + | + |  |  |  |
| PC3 |  | + |  | + |  | + |  |  |  |  |  |
| PC4 |  |  | + |  | + | + |  | + |  |  |  |
| PC5 |  |  | + |  |  |  | + |  |  | + |  |
| PC6 |  |  |  |  |  |  | + |  | + |  |  |
| PC7 |  |  | + |  | + | + |  | + |  | + | + |

**5. MATRIX A OF THE INFLUENCE OF DISCIPLINE ON THE FORMATION OF EDUCATIONAL OUTCOMES AND INFORMATION ON LABOR INTENSITY**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **№** | **Module name** | **Сycle** | **Сomponent** | **Name of the discipline**  | **Brief description of the discipline**  | **Amount of credits** | **Formed educational outcomes (codes)** |
| **EО1** | **EО2** | **EО3** | **EО4** | **EО5** | **EО6** | **EО7** | **EО8** | **EО9** | **EО10** | **EО11** |
| 1 | Module of scientific and pedagogical training | BD | UC | History and philosophy of science | Examines the basic laws of development and functioning of science, the philosophical and methodological foundations of modern methods of scientific knowledge are considered; describes the methodological apparatus of modern history and philosophy of science; discusses the formation of a scientific and methodological outlook on the basis of knowledge of the features of modern science; actual problems of the history and philosophy of science, the ability to actively use the acquired knowledge of history and methodology in scientific research. | 4 | **ѵ** |  |  |  | **ѵ** |  |  |  |  |  |  |
| 2 | BD | UC | Foreign language (professional) | General scientific, special terminology, grammatical material is considered, sufficient for the implementation of oral and written communication in adjoining and professional communication, using the methods of oral, written and electronic communication in English; stylistic features of oral and written language are explained.scientific discourse, rationalmethods of working with texts; the rules for presenting scientific information in different areas of communication are analyzed. | 4 |  | **ѵ** |  |  |  |  |  |  |  |  |  |
| 3 | BD | UC | Psychology of management | Psychological theories and management methods, modern trends in scientific management are considered. The methodological analysis of the problem of personality psychology, the psychological characteristics of the personality, methods of management, taking into account psychological patterns, are discussed. The processes of managerial activity, psychological knowledge and skills are analyzed in the context of their application in the practice of self-knowledge, communication, professional and personal growth. | 4 |  |  | **ѵ** | **ѵ** |  |  | **ѵ** |  |  |  |  |
| 4 | Methodological foundations of teaching | BD | UC | Higher school pedagogy | The regularities of the development of the system of higher education are considered; essence, content, pedagogical patterns of the educational process of higher education; modern approaches to design are discussedscientific and pedagogical activity; the main forms, technologies, methods and means of organizing the processes of education and upbringing, methods of pedagogical communication witheducationalprocess; examples of the use of digital technologies in the implementation of the educational process are given. | 4 |  |  |  | **ѵ** |  | **ѵ** | **ѵ** |  |  |  |  |
| 5 | PD | UC | Teaching Methods of special disciplines | The discipline considers the planning and conduct of training sessions, taking into account the specifics of applied and experimental physics, the use of scientifically based methods and means of teaching physics, scientific and methodological analysis of sections of applied and experimental physics. The ways of implementing modern technologies in education, their choice and design, depending on the age capabilities of students and the content of the material being studied, are analyzed. | 5 |  |  |  | **ѵ** | **ѵ** | **ѵ** | **ѵ** |  |  |  |  |
| 6 | BD | UC | Pedagogical practice | The student studies and analyzes the organization of the educational process in higher education; experience of teaching leading University teachers during the visit to classes; visits scientific and methodological consultations; plans, develops the content of training sessions and independently conducts them; works individually with students; conducts reflection of their own pedagogical activity; prepares reports on the results of practical training and its protection. | 4 | **ѵ** |  |  | **ѵ** |  | **ѵ** |  |  |  |  | **ѵ** |
| 7 | BD | UC | Research Practice | During the practice, the student plans research work, gets acquainted with the theme of research works, selects the topic of research, studying special literature; collects, processes, analyzes and systematizes scientific information on the topic; makes presentations at research seminars, conferences; makes a report on research work and makes a presentation of the work performed, which are discussed at the Department. | 7 | **ѵ** | **ѵ** |  |  |  | **ѵ** |  |  | **ѵ** |  | **ѵ** |
| 8 | Scientific methods of cognition of modern physics | BD | EC | History and methodology of physics | The main paradigms and actual problems of development of science and education, questions of innovative development of educational institutions are considered in discipline; problems of scientific and educational activity are analyzed; methods of the solution of problems of development of science, modern education and educational institution; ways of work with various sources of pedagogical knowledge; types of educational activity; the main forecasting, design and modeling. | 4 |  |  |  |  |  |  | **ѵ** |  |  |  |  |
| 9 | BD | EC | Modern Problems of Science and Education | The discipline discusses the purpose and content of research activities; methodological foundations of research, design of educational programs; methods of theoretical and empirical research; requirements for research methods; methods of organization and conduct of pedagogical and physical experiment; analyzes the systematic approach to the study of physical and pedagogical phenomena and processes; the use of statistical methods in the processing of research results. | **ѵ** |  |  |  |  | **ѵ** |  |  |  |  |  |
| 10 | BD | EC | Actual Problems of Modern Physics | The discipline discusses the General laws of physical science, the evolution of the basic physical views, the process of formation of the principles and concepts of physics, the problems facing modern physical science; analyzes the stages of development of physics, the logic of physical science; discusses the current state of physics and its relationship with other sections of natural science disciplines and technologies. | 5 | **ѵ** |  |  |  |  |  | **ѵ** |  |  |  |  |
| 11 | BD | EC | Modern Problems of Astrophysics | The physical processes responsible for the nature and observable features of space objects and phenomena are considered; the features of the main processes occurring at the stages of the evolution of the Universe; the main postulates underlying modern cosmology are outlined;Photometric and spectroscopic methods of astronomical observations onlarge telescopes and processing of the results of observations, as well as methods for solving problems of astrophysics are analyzed. | **ѵ** |  |  |  |  |  | **ѵ** |  |  |  |  |
| 12 | Selected chapters of physics course | PD | EC | Selected Chapters of Atomic and Nuclear Physics | The discipline deals with the features of multi-electron atoms and molecules, the interaction of radiation and matter, the spectra of substances, the effects observed when an atom is in the field of external forces; the main methods of nuclear physics research; laws of nuclear reactions; the laws of the passage of radiation through matter; sources and detectors of nuclear radiation; practical applications of the theory of atomic and nuclear physics. | 6 |  |  |  |  | **ѵ** |  |  | **ѵ** |  |  |  |
| 13 | PD | EC | Optical Spectroscopy | "Optical spectroscopy" is the study of modern optical spectroscopy methods for conducting fundamental and applied studies of physical, chemical, and biological processes in various media (gases, liquids, crystals, metals, dielectrics, semiconductors, heterogeneous structures, films, composite materials, nanomaterials, biomaterials, etc.). The fundamental foundations of the interaction of radiation with matter, the fundamental physical models for describing optical phenomena and experimental results, and laser technology are discussed in detail. |  |  |  |  | **ѵ** |  |  | **ѵ** |  |  |  |
| 14 | PD | EC | Selected Chapters of Condensed Matter Physics | The discipline deals with the features of the quantum-mechanical description of quasi-static excitations in condensed matter, the main thermodynamic and kinetic characteristics, models of collective and bound States and their excitations in solids, modern trends in research on the physics of the condensed state; analyzes the application of modern methods of the theory of condensed state to solving practical problems and methods of physical experiment. | 6 |  |  |  |  | **ѵ** |  |  | **ѵ** |  |  |  |
| 15 | PD | EC | Methods of Nanomaterials Research | The discipline deals with the theoretical foundations of scanning electron microscopy and X-ray diffractometry-analytical methods for studying the physical and chemical properties of structural and composite materials and nanomaterials. The manual is intended for independent study of theoretical material during the practice of performing individual tasks. It is focused on providing high-quality development of practical skills for conducting theoretical and experimental studies of objects at the nanoscale. |  |  |  |  | **ѵ** |  |  | **ѵ** |  |  |  |
| 16 | Innovative processes in education | PD | EC | New Educational Technologies in the Process of Teaching Physics | The discipline analyzes modern technologies of education, examines their features; discusses the features of the construction of cognitive activity of students in the implementation of innovative technology in the learning process; shows the possibility of using innovative technologies in teaching physics in the term and extracurricular activities; planning the learning process in accordance with a certain technology and methods of assessing the educational effects of a particular technology. | 4 |  |  |  | **ѵ** | **ѵ** |  |  | **ѵ** | **ѵ** |  |  |
| 17 | PD | EC | Didactic Bases of Methods of Teaching Physics | The discipline discusses the purpose and content of research activities; methodological foundations of research, design of educational programs; methods of theoretical and empirical research; requirements for research methods; methods of organization and conduct of pedagogical and physical experiment; analyzes the systematic approach to the study of physical and pedagogical phenomena and processes; the use of statistical methods in the processing of research results. |  |  |  |  |  | **ѵ** |  |  |  | **ѵ** | **ѵ** |
| 18 | BD | EC | Physical Applications of Differential Equations | The discipline is aimed at forming ideas about the concepts and methods of the theory of ordinary differential equations and equations with independent derivatives.The content of the discipline consists of the following topics: ordinary differential equations, independent derivative differential equations, application of differential equations in mechanics, physical problems leading to differential equations | 6 |  |  |  |  |  |  | **ѵ** | **ѵ** |  |  |  |
| 19 | BD | EC | Application of Criteria-Based Assessment in Teaching Physics at the university | The discipline considers the theoretical foundations of criteria-based assessment; requirements for the criteria-based assessment system; criteria for assessment without descriptors and with descriptors; creation of criteria-based work; provides examples of the development of criteria for evaluating laboratory work and solving physical problems, the presented presentation and the completed scientific project; discusses the system for converting points into an assessment. |  |  |  |  |  | **ѵ** |  |  |  |  | **ѵ** |
| 20 | PD | EC | The use of Pedagogical Methods of Action Research and Lesson Study in Teaching Physics | The discipline is aimed at developing the skills of planning, implementing and analyzing the effectiveness of using Lesson Study, Action Research. The discipline examines the issues of involving students in the process of Lesson Study, Action Research, transferring practical knowledge gained as a result of using Lesson Study to colleagues, conducting a discussion of Lesson Study in order to analyze the reaction of the "studied" students to the method used, the progress they have made, the learning results they demonstrate or the learning difficulties they experience, as well as the experience gained for further improvement of teaching methods. | 7 |  |  |  |  |  | **ѵ** |  |  |  | **ѵ** |  |
| 21 |  | PD | EC | Development of Research Competence of Students in the Process of Teaching Physics | Within the framework of the discipline, the issues of teaching methods in physical-mathematical and natural-science profiles, the tasks and results of physical education in specialized classes, the analysis of the possibilities of problem-based, project-based and research methods of teaching in the implementation of the tasks of specialized training, the project-research activities of students of physical-oriented profiles (physical-mathematical, natural-science) and its educational results are considered. |  |  |  | **ѵ** | **ѵ** |  |  |  |  |  |  |
| 22 |  |  | Management of Scientific and Pedagogical Research | Within the framework of the study of the discipline, such issues as the concept of management in science, general, particular and special laws of management, the mechanism of formation of management principles, the external and internal environment of the organization of science (university), types of information situations, the process approach to management, management decision, management decision stages, management approaches, methods of development and decision-making, tasks and methods of human resources management, methods of motivation, approaches to conflict management are considered. | 7 |  |  | **ѵ** | **ѵ** |  |  |  |  |  |  |  |
| 23 |  |  | Management Methods in Education and Coaching Workshop | The following questions are considered: the concept of coaching., The technology of individual coaching: working with a project, the technology of coaching, the Algorithm of a coaching session. The main tasks and techniques of each stage, Working with a project in coaching, Coaching technology: working with motivation and values in coaching, The role of motivation in achieving goals, External and internal motivation, Methods of updating internal motivation, Criteria for the effectiveness of coaching. |  |  | **ѵ** |  |  |  |  |  | **ѵ** |  |  |
| 24 | PD | EC | Computer Technologies in Physical Science and Education | On discipline the possibility of numerical modeling of physical processes and realization of models on the basis of public programming languages basic and Pascal is considered. Such an approach with minimal mathematization of the phenomenon allows to develop physical intuition and the ability to apply the knowledge of physics in applied activities. | 7 |  |  |  |  |  | **ѵ** |  | **ѵ** |  |  |  |
| 25 | PD | EC | Methodology and Technology of Organizing Distance Learning in Physics at the University | Considered methodological issues of distance learning and e-learning methods, examines the features of the organization of the educational process using remote educational technologies, taking into account the achievements of science, modern educational practice and advanced pedagogical experience. |  |  |  |  |  | **ѵ** |  |  |  | **ѵ** |  |
| 26 | Module of Final Attestation |  |  | Research work of a master's student, including internship and completion of a master's thesis | The student makes a dissertation plan, a list of used literature; performs a scientific review on the topic of the study, the results of which prepares the article; collects, processes scientific, secondary information on the topic of the thesis; develops modern research methods, research tools; solves research problems using modern methods of processing, verification and presentation of scientific data; prepares an article, thesis and abstract. | 24 |  |  |  |  |  |  |  | **ѵ** |  | **ѵ** | **ѵ** |
| 27 |  |  |  | Execution and Defense of Master Thesis | Master's degree student prepares thesis according to the requirements for such works; performs a scientific report on the main results of the prepared thesis, based on the results of research work. When defending a thesis, a master's student must demonstrate their research and pedagogical competence acquired during the study in the master's program and their compliance with the requirements of the educational program. | 12 |  |  |  |  |  |  |  | **ѵ** |  | **ѵ** | **ѵ** |

**5. A SUMMARY TABLE SHOWING THE VOLUME OF LOANS IN THE CONTEXT OF THE MODULES OF THE EDUCATIONAL PROGRAM**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | The number of studied disciplines | Numberofcredits KZ | Totalhours | Totalcredits KZ | Number |
| ОК | VS | EC | Theoreticaltraining | Pedagogicalpractice | ResearchPractice | ResearchPractice | ResearchPractice | exam | differentialcheck |
| 1 | 1 | 3 |  | 5 | 2 | 29 |  | - | 1 | - | 900 | 30 | 6 | 2 |
| 2 | 3 |  |  | 4 | 23 | 4 |  | 3 | - | 900 | 30 | 4 | 2 |
| 2 | 3 | 3 |  |  | 3 | 21 |  | 7 | 2 | - | 900 | 30 | 3 | 2 |
| 4 | 1 |  |  | 0 | 0 |  | - | 18 | 12 | 900 | 30 |  | 1 |
| total |  |  |  | 5 | 9 | 66 | 8 | 12 | 24 | 12 | 3600 | 120 | 13 | 7 |

1. **STRATEGIES AND METHODS OF TRAINING, MONITORING AND EVALUATION**

|  |  |
| --- | --- |
| **Strategies and learning** | **Student - centered learning**: **the** learner is the center of teaching/learning **and an active** participant in the process of learning and decision-making.**Practice-oriented learning**: focus on the development of practical skills. |
| **Teaching methods** | Conducting lectures, seminars, various types of practices with:* application of innovative technologies:
* problem learning;
* case study;
* group work and creative groups;
* discussions and dialogues, intellectual games, olympiads, quizzes;
* methods of reflection, projects, benchmarking;
* Bloom's taxonomy;
* presentations;
* rational and creative use of information sources :
* multimedia educational programs ;
* electronic textbooks ;
* digital resources .

Organization of independent work of students, individual consultations. |
| **Monitoring and assessing the achievability of learning outcomes** | **Current control** on each topic of the discipline, control of knowledge in classroom and extracurricular activities ( *according to the syllabus* ). Evaluation forms:* surveys;
* testing topics of academic discipline;
* test papers;
* protection of independent creative works;
* discussions;
* trainings;
* colloquia;
* essay , etc.

**R intermediate control** at least two times during one academic period within the same academic discipline.**Intermediate certification** is carried out in accordance with the working curriculum, academic calendar.Conduct forms:* examination in the form of testing;
* oral exam;
* a written exam;
* combined exam;
* protection of projects;
* protection of reports on practices .

**Final state certification.** |

**7. TRAINING AND RESOURCE SUPPORT OF THE EP**

|  |  |
| --- | --- |
| **Information Resource Center** | The structure of the OIC includes 6 subscriptions, 16 reading rooms, 2 electronic resource centers (ERC). The network infrastructure of the JIC is based on 180 computers with Internet access, 110 workstations , 6 interactive whiteboards, 2 video doubles, 1 video conferencing system, 3 A-4 format scanners, the JIC software - AIBS "IRBIS-64" under MS Windows (basic set of 6 modules), stand-alone server for uninterrupted operation in the IRBIS system.The library fund is reflected in the electronic catalog available to users on the site <http://lib.ukgu.kz>on -line 24 hours 7 days a week.Thematic databases of their own generation have been created: "Almamater", "Proceedings of SKSU scientists", "Electronic archive". Online access from any device 24/7 via external link<http://articles.ukgu.kz/ru/pps>.Catalogs are processed electronically. EC consists of 9 databases: "Books", "Articles", "Periodicals", "Proceedings of the teaching staff of SKSU", "Rare Books", "Electronic Fund", "SKSU in Print", "Readers" and "SKR".The JIC provides its users with 3 options for accessing its own electronic information resources: from the "Electronic Catalog" terminals in the catalog hall and divisions of the JIC; through the information network of the university for faculties and departments; remotely on the website of the library <http://lib.ukgu.kz/>.Open access to international and republican resources: "SpringerLink", "Polpred", "Web of Science", "EBSCO", "Epigraph", to electronic versions of scientific journals in the public domain, "Zan", "RMEB", "Adebiet" , Digital library "Aknurpress", "Smart-kіtаr", "Kitаr.кz", etc.For people with *special needs* and disabilities, the library website has been adapted to the work of visually impaired users |
| **Material and technical base** |  For the preparation of undergraduates in this direction, there is an appropriate material and technical base of the specialty, that is, classrooms, laboratories, a computer class that meets the requirements of the SES. The Department of Physics includes 6 classrooms: mechanics and molecular physics, electromagnetism, the TSE Laboratory and astronomy, optics, atomic and nuclear physics (an interactive whiteboard is installed here) and a computer class. There is a specialized scientific and technical experimental base in the laboratories of the center "SAPA" and "IRLIP", where EP 7M01520 - "Physics" meets sanitary and technical standards and provides all types of practical, disciplinary training, research work of undergraduates provided for in the working curriculum of the specialty. |

**AGREEMENT SHEET**

by Education Program code 7М01520-Physics

Director of the Institute

Postgraduate education \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Konarbaeva Z.K.

Sign

Director of DASc \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Nazarbek Y.B.

 Sign

Director of DE&C \_\_\_\_\_\_\_\_\_\_\_\_\_ T.Bazhirov

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