Ф.7.02-10

MINISTRY OF SCIENCES AND HIGHER EDUCATION OF THE REPUBLIC OF KAZAKHSTAN

M. AUEZOV SOUTH KAZAKHSTAN UNIVERSITY

"APPROVED"
Chairman of the Board-Rector
D.Zh. Ahmed-Zaki
"26" 11 2025y.

EDUCATION PROGRAM

**6B01504 PHYSICS (IP)**

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| Registration number | 6B01500457 |
| Code and classification of the field of education | 6B01- Pedagogical Science |
| Code and classification of training areas | "6B015-Training of Teachers in Natural Science Subjects" |
| Group of educational programs | B010 Teacher training in physics |
| Type of EP | Innovative EP |
| ISCE level | 6 |
| NQF level | 6 |
| SQF of education level | 6 |
| Language of learning | Kazakh, Russian, English |
| The complexity of EP | 240 credits |
| Distinctive features of EP | Not |
| Partner University (JEP) - | - |
| University partner (DDEP) - | - |

Shymkent, 2026

Developers:

| Full Name | Position | Signature |
|---|---|---|
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The educational program has been updated taking into account the new model of inclusive education and agreed with the City department of employment and social protection.

Deputy Head of the Department of Employment
and Social Protection of Shymkent _____ K.Kaldykarayev

The EP was considered at a meeting of the Academic Quality Committee of the Higher School «Natural Sciences and Pedagogy», Minutes №6 «23» 02 2026y.

Chairman of the Committee _____ A.Z.Tursynbaev

The EP was considered and recommended for approval at Educational-methodical meeting of M. Auezov SKU, Minutes 4 «27» 02 2026y.

Chairman of the EMM _____ E.I.Imangaliyev

The EP was approved by the decision of the Academic Council of the University
Minutes 14 «26» 03 2026y.

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## 1. **CONCEPT OF THE EDUCATIONAL PROGRAM**

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| **Mission of the University** | Generating new competencies, training a leader who translates research thinking and culture. |
| **University Values** | – Openness - open to change, innovation and cooperation.<br>– Creativity - generates ideas, develops them and turns them into values<br>– Academic freedom - free to choose, develop and act.<br>– Partnership - creates trust and support in a relationship where everyone wins.<br>– Social responsibility - ready to fulfill obligations, make decisions and be responsible for their results. |
| **Graduate Model** | – Deep subject knowledge, their application and continuous expansion in professional activity<br>– Information and digital literacy and mobility<br>– Research skills, creativity and emotional intelligence<br>– Entrepreneurship, independence and responsibility for their activities and well-being<br>– Global and national citizenship, tolerance to cultures and languages |
| **Alignment of the Educational Programme with the Sustainable Development Goals (SDGs)** | **SDG 4. Quality Education**<br>The programme prepares physics teachers who can use contemporary pedagogy, STEM approaches, digital tools, artificial intelligence and inquiry-based learning.<br>**SDG 7. Affordable and Clean Energy**<br>Studying the physics of energy, renewable sources and energy efficiency builds the ability to explain and evaluate contemporary energy solutions.<br>**SDG 9. Industry, Innovation and Infrastructure**<br>Laboratory investigation, modelling, robotics and digital laboratories develop skills for creating and applying innovative educational and technological solutions.<br>**SDG 12. Responsible Consumption and Production**<br>Physics knowledge is applied to analyse resource efficiency, the environmental effects of technologies and responsible consumption practices.<br>**SDG 13. Climate Action**<br>Understanding the physical foundations of climate processes helps integrate climate change, environmental responsibility and evidence-based action into physics education.<br>**SDG 17. Partnerships for the Goals**<br>Cooperation with educational institutions, employers and other stakeholders ensures the programme's practical relevance and supports the joint renewal of its content. |
| **Uniqueness of the OP** | • Orientation to the regional labor market and social order through the formation of professional competencies of the graduate, adjusted to meet the requirements of stakeholders.<br>• Practical 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.<br>The uniqueness of EP 6B01504 Physics IP lies in the fact that graduates are universal specialists who have competencies with the ability to teach mathematics and physics in secondary and secondary specialized educational institutions; and are able to solve professional tasks using e-learning technology; it boils down to the following: the student and his |

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| | individual work are put at the center of the learning process; when studying, the student is faced with real problems from customers, the active role of the student in training; the teacher plays the role of a consultant and assistant to students in their self-education; in the process of studying, the university provides modern laboratories and computer classes; flexible and dynamic modular curriculum and discipline programs. This EP is necessary for the Republic of Kazakhstan, in which more than 40% of schools are small. |
| **Academic Integrity and Ethics Policy** | The university has taken measures to maintain academic integrity and academic freedom, protection from any type of intolerance and discrimination:<br>• Rules of academic integrity (order No. 212 of October 10, 2022);<br>• Anti-corruption standard (order No. 221 n/a dated 12/07/2021).<br>• Code of Ethics (Order No. 212 of October 10, 2022) |
| **Regulatory and legal framework for the development of EP** | 1.Law of the Republic of Kazakhstan «On Education»;<br>2. Model rules for the activities 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.<br>3. Standard rules for admission to training in educational organizations implementing educational programs of higher and postgraduate education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated October 31, 2018 No. 600.<br>4. State mandatory standards for higher and postgraduate education, approved by order of the Ministry of Education and Science of July 20, 2022 No.2.<br>5. Rules for organizing the educational process in credit technology of education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated April 20, 2011 No. 152.<br>6. Qualification reference book for positions of managers, specialists and other employees, approved by order of the Minister of Labor and Social Protection of the Population of the Republic of Kazakhstan dated December 30, 2020 No. 553.<br>7. Methodological recommendations for introducing ECTS principles into the educational process and expanding academic freedom. Appendix to the order of the Minister of Science and Higher Education. of the Republic of Kazakhstan dated February 12, 2024 No.57.<br>8. Guidelines for the development of educational programs for higher and postgraduate education, Appendix 1 to the order of the Director of the National Center for the Development of Higher Education of the Ministry of Education and Science of the Republic of Kazakhstan dated May 4, 2023 No. 601 н/к. |
| **Organization of the educational process** | – Implementation of the principles of the Bologna Process<br>– Student-centered learning<br>– Availability<br>– Inclusivity |
| **Quality assurance of EP** | – Internal quality assurance system<br>– Involvement of stakeholders in the development of the EP and its evaluation<br>– Systematic monitoring<br>– Updating the content (updating) |
| **Requirements for** | They are established in accordance with the Standard Rules for admission |

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| **applicants** | to training in educational organizations implementing educational programs of higher and postgraduate education by order of the Ministry of Education and Science of the Republic of Kazakhstan No. 600 dated October 31, 2018. |
| **Conditions for the implementation of educational programs (EP) for persons with disabilities and special educational needs(SSN)** | For students with SEN (special educational needs) and persons with disabilities (PSI), tactile PVC tiles, specially equipped toilets, a mnemonic diagram, and shower bars have been installed in educational buildings and student dormitories. Special parking spaces have been created. Crawler lift installed. There are desks for people with limited mobility (PLM), signs indicating the direction of movement, ramps. In the educational buildings (main building, building No. 8) there are 2 rooms with six working places adapted for users with disorders of the musculoskeletal system (DMS).For visually impaired users, the SARA™ CE Machine (2 pcs.) is available for scanning and reading books. The library website is adapted for the visually impaired. There is a special NVDA audio program with a service. The JIC website http://lib.ukgu.kz/ is open 24/7.<br>An individual differentiated approach is provided for all types of classes and in the organization of the educational process. |

## 2. PASSPORT OF THE EDUCATIONAL PROGRAM

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| **Purpose of the EP** | The aim of the educational program is to train physics teachers with competencies in new fields that meet modern challenges in education and form competencies necessary for teachers of the 21st century who live and work in a world of variability, uncertainty, complexity, ambiguity. |
| **Tasks of the EP** | - Developing universal competencies: critical thinking, teamwork, communication, self-education.<br>- Developing subject-specific competencies: deep knowledge of physics and mathematics, interdisciplinary connections (physics + computer science + robotics).<br>- Mastering pedagogical technologies: project-based learning, problem-based approach, e-learning (LMS).<br>- Preparing for work in small schools: universality (physics + mathematics), adaptability, individualization of learning.<br>- Developing research competencies: setting up experiments, data analysis, using digital labs (Phet).<br>- Fostering sustainable development values: integrating SDGs into the educational process (energy conservation, ecology, climate).<br>- Ensuring inclusion and equal opportunities: adapting materials, taking into account the diversity of students and schoolchildren.<br>-Creating conditions for the formation of in-demand knowledge and skills, a conscious attitude towards improving the well-being of the population and protecting the planet in the context of the SDGs |
| **Harmonization of EP** | • 6 level of the National Qualifications Framework of the Republic of Kazakhstan;<br>• Dublin descriptors of the 6th level of qualification;<br>• 1 cycle of a Framework for Qualification of the European Higher Education Area);<br>• 6th Level of European Qualification Framework for Life long Learning). |
| **Connection of EP with the professional sphere** | Professional standard "Teacher", approved by the order of the Acting Minister of Education of the Republic of Kazakhstan dated December 15, 2022 No. 500. Registered with the Ministry of Justice of the Republic of Kazakhstan on December 19, 2022 No. 31149.<br>Professional standards for teachers of educational organizations, 24.02.2025 |
| **Name of the degree awarded** | After successful completion of this educational program, the graduate is awarded the degree:“Bachelor of "6B01504-Physics IP" |
| **List of qualifications and positions** | Teacher, methodologist, instructor, tutor, team leader, manager in education<br>Qualification handbook of managers, specialists and other employees, approved by the order of the Acting Minister of Labor and Social Protection of the Population of the Republic of Kazakhstan dated October 25, 2017 No. 360. |
| **Field of professional activity** | - field of education;<br>- science |
| **Objects of professional activity** | The objects of professional activity of graduates are organizations and educational institutions of various forms of ownership, scientific and research centers. |
| **Subjects of professional activity** | The subjects of the bachelor's professional activity in EP 6B01504 Physics (IP) - the educational process in the unity of its value-target orientations, content, methods, forms and results;<br>- research, innovation, information and analytical activities in the field of mathematics, physics and teaching methods, pedagogy and psychology. |
| **Types of** | Bachelor in EP 6B01504 Physics (IP) can perform the following |

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| **professional activity** | types of professional activities:<br>– educational;<br>– pedagogical;<br>– educational and educational;<br>– educational and technological;<br>– organizational and methodological.<br>– scientific research; |
| **Learning outcomes** | **LO1.** Possess intercultural and communicative competence, apply skills of independent continuation of further education and build professional relationships in pedagogical and social activities; purposefully use means and methods that ensure the preservation and strengthening of health in professional activities<br>**LO2.** To collect and interpret information for the formation of knowledge taking into account social, ethical and scientific considerations, critically evaluate their values, attitudes, ethical principles and teaching methods, set new goals for their own pedagogical development;<br>**LO3.** Critically select theoretical knowledge based on advanced concepts of physics with the help of various information and communication technologies and use the knowledge to improve physics education and their own professional growth;<br>**LO4.** Understand the psychological and pedagogical problems of teaching and educating students with disabilities in inclusive education, take into account the diverse abilities of students in the learning process, ethically support their psychological well-being in the life and educational context;<br>**LO5.** To recognize and understand fundamental scientific concepts that have fundamental methodological and theoretical significance for understanding and mastering the physical sciences, to argue their own position of applying and integrating knowledge from other fields of sciences to solve global and local problems of physics;<br>**LO6.** To cover holistically and objectively the main stages of the history, evolution of the forms of statehood and civilization of the Kazakh people, to know the methods of scientific research and academic writing, to understand the importance of the principles and culture of academic honesty;<br>**LO7.** Demonstrate strong academic and practical knowledge in the field of physics, operate with forms and methods of scientific knowledge, various ways of mastering the surrounding world, understand the role of science in the development of society;<br>**LO8.** To conduct scientific research in the chosen field of experimental and (or) theoretical physical research with the help of modern instrumentation and information technology, taking into account domestic and foreign experience;<br>**LO9.** Apply modern methods of processing, analysis and synthesis of physical information in their chosen field of physical research, operate with basic mathematical concepts and operations and are able to apply them in solving physical problems, implement analytical and technological solutions in the field of experimental and theoretical physics;<br>**LO10.** Conduct integrated lessons with elements of STEM learning, use CLI and artificial intelligence technologies, professional development methods for teachers of subject-language teaching of natural subjects;<br>**LO11.** Work in interdisciplinary teams, have the skills to apply scientific knowledge in solving social problems;<br>**LO12.** He is able to carry out the educational process of methodically based physics lessons based on the scientific principles of building a school curriculum, using modern educational technologies, including digital tools and artificial intelligence to adapt and personalize learning. |

## 3 COMPETENCIES OF A GRADUATE OF THE EP

| **GENERAL COMPETENCIES** (SOFTSKILLS). Behavioral skills and personal qualities | |
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| GC 1. Competence in managing one's literacy | OK1.1. The ability to self-study, self-develop and constantly update their knowledge within the chosen trajectory and in an interdisciplinary environment.<br>OK 1.2. The ability to express thoughts, feelings, facts and opinions in the professional sphere.<br>OK 1.3. The ability to mobility in the modern world and critical thinking. |
| GC 2. Language competence | OK2.1. The ability to build communication programs in the state, Russian and foreign languages.<br>OK 2.2. The ability to interpersonal social and professional communication in the context of intercultural communication. |
| GC 3. Mathematical competence and competence in the field of science | OK3.1. The ability and willingness to apply the educational potential, experience and personal qualities acquired during the study of mathematical, natural science, technical disciplines at the university, to determine ways to control and evaluate the solution of professional problems, the development of mathematical and natural science thinking; |
| GC 4. Digital competence, technological literacy | OK4.1. The ability to confidently and critically use modern information and digital technologies for work, leisure and communication;<br>OK 4.2. The ability to possess the skills of using, restoring, evaluating, storing, producing, presenting and exchanging information through a computer, communicating and participating in networks using the Internet in the field of professional activity; |
| GC 5. Personal, social and educational competencies | OK5.1. The ability to possess social and ethical values based on public opinion, traditions, customs, norms and to focus on them in their professional activities;<br>OK 5.2. The ability to know the cultures of the peoples of Kazakhstan and observe their traditions; to observe the foundations of the legal system and legislation of Kazakhstan, to know the trends of social development of society;<br>OK 5.3. The ability to navigate in various social situations; be able to find compromises, correlate your opinion with the opinion of the team; possess the norms of business ethics, ethical and legal norms of behavior; strive for professional and personal growth;<br>OK 5.4. The ability to work in a team, correctly defend their point of view, offer new solutions; demonstrate tolerance towards other individuals. |
| GC 6. Entrepreneurial competence | OK 6.1. The ability to be creative and demonstrate entrepreneurial skills.<br>OK 6.2. The ability to manage projects to achieve professional goals.<br>OK 6.3. Ability to work with consumer requests |
| GC 7. Cultural awareness and self-expression | OK 7.1. The ability to know and understand the traditions and culture of the peoples of Kazakhstan.<br>OK7.2. The ability to be tolerant of the traditions and culture of other peoples of the world, to be aware of the attitudes of tolerant behavior; to be not subject to prejudice, to possess high spiritual qualities, formed as an intelligent person. |
| PROFESSIONAL COMPETENCIES (HARD SKILLS). | |
| Theoretical knowledge and practical skills specific to this field | PK1. The ability to systematize, generalize and disseminate methodological experience (domestic and foreign) in the field of teaching methods of mathematics and physics |
| | PK2. The ability to apply knowledge of physics in educational activities, and knowledge of modern problems of the methodology of teaching mathematics and physics of its latest achievements in their pedagogical and research activities |
| | PK3. The ability to apply modern methods and technologies of organizing and implementing the educational process in mathematics and physics at various educational levels in secondary and secondary specialized educational |

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| | institutions, including when teaching gifted students and students with special needs. |
| | PK4. Possess knowledge in the field of mathematics and physics, skills and abilities to conduct physical experiments, process measurement results, observe physical phenomena and explain them; and solve typical problems of mathematics.. |
| | PK 5. Ability to apply various methods of physical research in a selected subject area: experimental methods, statistical methods of experimental data processing, methods of theoretical physics, computational methods, methods of mathematical and computer modeling of objects and processes |
| | PK6 The ability to conduct scientific research in a selected field of education and methods of teaching mathematics and physics using information technology. |
| | PK7 Ability to design, conduct and analyze physics experiments using digital laboratories, sensors, software (Phywe, Pasco, Vernier, Python, Arduino), interpret measurement results, explain physical phenomena and develop STEM projects for school education. |
| | PK8 The ability to possess knowledge in the field of physics, skills and abilities to conduct physical experiments, process measurement results, observe physical phenomena and explain them. |
| | PK9 Ability to systematize, generalize and disseminate methodological experience (domestic and foreign) in the field of methods of teaching physics and computer science. |

### 3.1 MATRIX OF CORRELATION OF THE LEARNING OUTCOMES OF THE EDUCATIONAL PROGRAM AS A WHOLE WITH THE COMPETENCES FORMED

| | LO 1 | LO 2 | LO 3 | LO 4 | LO 5 | LO 6 | LO 7 | LO 8 | LO 9 | LO 10 | LO 11 | LO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GC 1 | + | | | + | | + | | | + | | | |
| GC 2 | | | | + | + | | + | | | + | | |
| GC 3 | | + | | + | | + | | | | | | |
| GC 4 | | | + | | | | + | | + | + | + | |
| GC 5 | + | + | + | | + | | + | + | | | | + |
| GC 6 | | + | | | | | | + | | + | + | + |
| GC 7 | + | | | | | + | | | | + | | |
| PC 1 | | | + | + | + | | + | | | | + | + |
| PC 2 | + | + | + | + | + | + | | | | | | |
| PC 3 | | + | | | + | + | | | + | + | | + |
| PC 4 | | | | + | | + | | + | | | + | |
| PC 5 | | + | | + | + | | + | + | | | | |
| PC 6 | | | | | | + | + | | | + | | |
| PC 7 | | | | + | | | | + | + | | + | |

## 4.MATRIX OF THE INFLUENCE OF MODULES AND DISCIPLINES ON THE FORMATION OF LEARNING OUTCOMES AND INFORMATION ON LABOR INTENSITY

| | Module | Cycle | component | **Name of the discipline** | **Brief description of the discipline** | Quantity loans | Generated learning outcomes (codes) | | | | | | | | | | | |
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| | | | | | | | RO1 | RO2 | RO3 | RO4 | RO5 | RO6 | RO7 | RO8 | RO9 | PO10 | PO11 | PO12 |
| 1 | Historical and Philosophical Competencies | GED | OC | History of Kazakhstan | Purpose: to form an objective view of the history of Kazakhstan based on a deep understanding and scientific analysis of the main stages, patterns, and peculiarities of the historical development of Kazakhstan.<br>Contents: Ancient people and the formation of a nomadic civilization. The Turkic civilization and the Great Steppe. Kazakh Khanate. Kazakhstan in the era of modern times. Kazakhstan is part of the Soviet administrative and command system. Declaration of independence of Kazakhstan. The state system, socio-political development, foreign policy and international relations. Methods and techniques of historical descriptions for analyzing the causes and consequences of events in the history of Kazakhstan. | 5 | | + | | | | + | | | | | | |

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| 2 | | GED | OC | Philosophy | Purpose: to form a holistic view of philosophy as a special form of cognition of the world, about its main sections, problems and methods of their study in the context of future professional activity. Formation of philosophical reflection, skills of introspection and moral self-regulation.<br>Content: the emergence of a culture of thinking. The subject and method of philosophy. Fundamentals of philosophical understanding of the world: questions of consciousness, spirit and language. Genesis. Ontology and metaphysics. Cognition and creativity. Education, science, technology and technology. Human philosophy and the world of values. Ethics. The philosophy of values. The subject of aesthetics as a field of philosophical knowledge. The philosophy of freedom. Philosophy of art. Society and culture. Philosophy of history. Philosophy of religion. "Mangilik El" and "Modernization of public consciousness" are a new Kazakh philosophy | 5 | | + | | | + | | + | | | | | | |
| 3 | Socio-Political knowledges | GED | OC | Social and Political Studies | **The goal** of forming knowledge about social and political activities, explaining social and political processes and phenomena. | 4 | + | + | | | + | | | | | | | | |

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| | | | | | **Content:**Consideration of the system of socio-ethical values of the society. Ways to use social, political, cultural, psychological institutions, features of youth policy in the modernization of Kazakhstani society and solve conflict situations in society and professional environment based on them. To study the methods of analysis and interpretation of political institutions and processes, ideas about politics, power, state and civil society, to understand and use the methods and methods of sociological, comparative analysis, to understand the meaning and content of the political situation in the modern world. Analysis and classification of the main political institutions. Socialization, identity and deviant behavior: the role of an inclusive approach. | | | | | | | | | | | | | |
| 4 | | GED | OC | Cultural Studies and Psychology | **Purpose:** The formation of scientific knowledge of history, modern trends, current problems and methods for the development of culture and psychology, the skills of a systematic analysis of psychological phenomena.<br>**Content:**Morphology, language, semiotics, anatomy of culture. Culture of nomads, proto-Turks, Turks. Medieval culture of Central Asia. Kazakh culture at the turn of the | 4 | + | + | | + | | | | | | | | + |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | XVIII - XIX centuries, XX century. Cultural policy of Kazakhstan. State Program "Cultural Heritage". National consciousness, motivation. Emotions, intellect. The will of man, the psychology of self-regulation. Individual typological features. Values, interests, norms are the spiritual basis. The meaning of life, professional self-determination, health. Communication of the individual and groups. Socio-psychological conflict. Models of behavior in conflict.Social and psychological foundations and development of an inclusive culture in modern society. Psychological characteristics and conditions for professional adaptation of individuals with special needs. Psychological support and tolerance as a way of social integration of people with special needs. Social and psychological barriers to interaction of people with special needs in modern society. | | | | | | | | | | | | | |
| 5 | The Basis of Social and Physical Develop | GED | EC | Ecosystem and Law | **Purpose:** Formation of integrated knowledge in the field of economics, law, ecology and life safety, research methods to achieve sustainable development of society. **Contents:** Fundamentals of safe | 5 | + | | | | + | + | | | + | + | | |

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| | ment | | | | interaction between man and nature, productivity of ecosystems and the biosphere. Improving the competitiveness of entrepreneurial activity of society, business and the national economy in conditions of limited resources within the framework of sustainable development goals of Kazakhstan. Systemic understanding of environmental issues and principles of sustainable development. Knowledge and observance of Kazakhstan"s rights, duties and guarantees of subjects, state regulation public relations to ensure social progress. Inclusion is a strategy of international law. Legal foundations of artificial intelligence. | | | | | | | | | | | | | |
| 6 | | GED | EC | Entrepreneurship and Financial Literacy | The purpose: Training skills in entrepreneurial activity organization, in managing personal and family financial resources, which are key to achieving financial well-being. Content: Entrepreneurship: essence, contents and conditions of formation. Legal forms of entrepreneurship. Risks in entrepreneurship. Business planning in entrepreneurship. Organization of entrepreneurial transactions. Culture and ethics of entrepreneurship. Financing of | | | | | + | + | | | + | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | entrepreneurial activity. The concept, goals and objectives of financial literacy. Money, settlements, and payments. Personal finance: income, expenses, budget. Taxes and taxation of individuals. Pensions and insurance. Banking services for the population. Bankruptcy of individuals and financial risks. Pyramid scheme and personal financial security. | | | | | | | | | | | | | |
| 7 | | BD | EC | Abai Studies | Formation of a full-fledged, human-loving, humane, tolerant citizen who succumbs to the humanistic teachings of Abai. Education of deep love for Abai"s thoughts about eternal values: reading, education, science, art, education, morality reflected in his poems and prose; reflection of the main sources that influenced the worldview of the poet-thinker; | 3 | | + | | | | + | | | | | | |
| 8 | | BD | EC | Muhtar Studies | Purpose: formation of historical, literary presentation on the work of M. Auezova in the context of history of literature, patriotism and cultural-spiritual position. Development of artistic thinking, skills of independent research activity.<br>Content: "I don't know," he said, " but I don't know." Activity of M. Auezova in the magazines "Sholpan", "Abay". Journalism M. Auezova. The main focus of Rasskazov is "day of | | | + | | | | + | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | the defenseless", "pictures of kyr", "read citizen", "Kokserek",the play Enlik-Kebek and the story "Kili Zaman", "The Story of Karash-Karash", the monograph" Abay Kunanbayev", the novel - epic" the way of Abay". | | | | | | | | | | | | | | |
| 9 | | BD | EC | Foundations of Anticorruption Culture | The discipline is aimed at developing students' anti-corruption worldview, legal culture and civic responsibility. The causes and consequences of corruption, norms of anti-corruption legislation, as well as mechanisms for countering corruption are considered. Mastering the discipline contributes to the development of skills of lawful behavior, critical assessment of social phenomena and a reasoned defense of one's own position. | | | | | | + | + | | | + | + | | |
| 10 | | BD | EC | Basics of artificial intelligence | Purpose: To develop competencies in the use of knowledge and practical application of artificial intelligence tools and methods, in alignment with the priorities of the AI-Sana program. Content: Introduction to Artificial Intelligence (AI). Development of practical skills and abilities, including: using AI tools; working with large language models (LLMs); utilizing no-code AI platforms; employing generative AI tools; image recognition; natural language | | | | | | | | | | | + | | + |

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| | | | | | processing (NLP); and data visualization through AI. Understanding the application of AI in various fields and exploring its potential through the integration of AI-Sana program approaches. | | | | | | | | | | | | | |
| 11 | | GED | OC | Physical Training | Purpose: the formation of social and personal competencies and the ability to purposefully use the means and methods of physical culture that ensure the preservation and strengthening of health in preparation for professional activity; to the persistent transfer of physical exertion, neuropsychic stresses and adverse factors in future work<br>Content: implementation of physical culture and health and training programs. A complex of general development and special exercises. Sports (gymnastics, sports and outdoor games, athletics, etc.). Control and self-control during classes, insurance and self-insurance. Judging competitions. Means of professionally applied physical training. Modern health-improving systems: the breathing system according to A. Strelnikova, K. Buteyko, K. Dinaiki, joint gymnastics according to Bubnovsky. | 8 | + | | | | | | | | | | | | |
| 12 | Instrume | GED | OC | Kazakh (Russian) | Purpose: formation of communicative | 10 | + | | | | | | | | + | | | |

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| | ntal and Commu nication | | | language | competence using the Kazakh (Russian) language in the socio-cultural, professional and public life, improvement of the ability to write academic texts.<br>Content: levels A1, A2, B1, B2-1, B2-2 (B2, C1 Russian) are presented in the form of cognitive- linguistic-cultural complexes consisting of spheres, topics, subtemes and typical situations of communication of international standard: social, social, cultural, educational and professional, modeled forms: oral and written communication, written speech works, listening. Demonstration of understanding of the language material in the texts of the educational program, possession of terminology and development of critical thinking. | | | | | | | | | | | | |
| 13 | | GED | OC | Foreign language | Purpose The goal is to form the intercultural and communicative competence of students in the process of foreign language education at a sufficient level A2 and the level of basic sufficiency B1. The student reaches the level B2 of the pan-European competence if there is a language level at the start above the level B1 of the pan-European competence<br>Content. levels A1, A2, B1, B2 are | 10 | + | | | | | | | | + | | | |

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| | | | | | presented in the form of cognitive - linguoculturological complexes consisting of spheres, topics, subtemes and typical situations of communication of international standard: socio-household, socio-cultural, educational and professional, modeled forms: oral and written communication, written speech works, listening. Demonstration of understanding of the language material in the texts of the educational program, possession of terminology and development of critical thinking. | | | | | | | | | | | | | |
| 14 | | GED | OC | Information and communication technologies | Purpose: formation of the ability to critically evaluate and analyze processes, methods of searching, storing and processing information, ways of collecting and transmitting information through digital technologies.<br>Contents: Introduction and architecture of computer systems. Software. Operating systems. Human interaction with computers. Database systems. Database management. Networks and telecommunications. Cyber defense. Internet technologies. Cloud and mobile technologies. Multimedia technologies. Smart technologies. Electronic technologies. Electronic business. Electronic | 5 | | | + | | | | | | + | | | |

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| | | | | | control. | | | | | | | | | | | | | |
| 15 | | BD | HsC | Advanced Foreign Language | Full reports on the topic. News and reports. Articles and messages on a modern problem, modern fiction. Active participation in discussions on a familiar issue. "For" and "against" on current issues. Writing essays, reports, and letters with special events and effects. | 4 | + | | | | | | | | + | | | |
| 16 | Basics of Psychological and Pedagogical Preparation | BD | HsC | Psychology in Education, Interaction and Communication | Purpose: to master modern psychological theories and models, the functioning of personality and its individual properties. Content: Future teachers contribute to the favorable development of students by promoting dialogue, interaction and communication in the educational process. They are able to communicate, interact and cooperate with the families of students, as well as in various other types of partnerships and create new relationships suitable for the development of their own pedagogical activities. | 5 | + | + | | + | | | | | | | | |
| 17 | | BD | | Psychological-pedagogical assessment (pedagogical practice, 2nd year) | Pre-service teachers familiarize themselves with the features of the integral pedagogical process of an educational institution and the formation of analytical-reflexive, research, design, and other skills in the field of psychological and | 2 | | | | + | | | | | | + | | + |

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| | | | | | pedagogical support of the educational process. | | | | | | | | | | | | | |
| 18 | Supporting Learners as Individuals | BD | HsC | Education Science and Key Learning Theories | The purpose of this course is to improve pedagogical competence in the field of pedagogy and didactics Future teachers study the basics of pedagogical science, such as conceptual ideas about a person, leading to various theories of learning and pedagogical models. Based on the understanding of theoretical concepts, future teachers can make appropriate pedagogical choices for various educational situations. | 3 | + | + | | | | | | | + | | | |
| 19 | | BD | | Introduction to the teaching profession (pedagogical practice, 1st year) | Pre-service teachers familiarize themselves with the educational process and the context of the educational institution and its adaptation to the conditions of future professional activity. | 1 | + | + | | | | | | | | + | | + |
| 20 | | BD | HsC | Age and Physiological Characteristics of Children's Development | Objective: to monitor the development of students, plan and implement age-appropriate learning processes, considering the individual needs of students, creatively support universal learning and the well-being of students. Students can: • Recognize individual starting points of different students, their learning potential and needs for specific support • consider the individual needs of their students for specific support, guidance, | 4 | + | + | | + | | | | | | | | |

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| | | | | | training and evaluation | | | | | | | | | | | | | |
| 21 | | BD | HsC | Inclusive Educational Environment | Objective: to develop students' knowledge of the scientific foundations of an inclusive educational environment, the ability to distinguish categories of learners with special educational needs, and the competence to provide psychological and pedagogical support for students with special educational needs (SEN).<br>This discipline is aimed at accepting the diversity of students, their support, the ability to identify obstacles to participation and learning that arise in schools; to determine development priorities and plan activities to support diversity (adaptation of program material, development of differentiated tasks; to promote cooperation in the school community in order to create a basis for inclusive values and support the participation and academic performance of students in sustainable school systems, be able to use assistive tools and ICTs to support all students in an inclusive environment.<br>The concept of Autism Spectrum Disorder (ASD) in children and the foundations of their support are | 5 | + | + | | + | | | | | | | | | |

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| | | | | | considered. Familiarization with international methodologies such as ABA therapy, PECS, TEACCH, and sensory integration is also included. | | | | | | | | | | | | | |
| 22 | | BD | HsC | Planning of Teaching and Individualization of Teaching Physics | Purpose: formation of skills of individualization of teaching, taking into account the diversity of students and the use of teaching technologies, based on pedagogical and independent research. Students can: • understand the requirements of competence, entrepreneurship and sustainable development in their pedagogical and subject area when planning and conducting training; • plan and predict other conditions that affect learning; • apply the principles of individual learning and guidance in practice, take into account the needs of their students, support the development of their personality and self-esteem. | 4 | | | + | | + | | | | | | + | |
| 23 | Teaching and Assessment for Learning | BD | HsC | Methods and Technologies of Teaching Physics | Purpose: to increase competencies in the field of pedagogy and didactics. Students have a holistic understanding of the methodological system of education, can model strategies and technologies for solving specific pedagogical problems, planning, guidance, teaching and evaluation, are able to use knowledge, forms, methods and | 5 | | | + | | + | | | | | | + | |

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| | | | | | technologies of teaching in accordance with the conditions of a particular school and the capabilities of students. Students can: • choose pedagogical models suitable for their training • apply teaching methods creatively and in a variety of ways, taking into account the opportunities offered by technology • use a suitable learning environment in your teaching • know and apply the rules and principles of copyright and data protection | | | | | | | | | | | | | |
| 24 | | BD | HsC | Assessment and Development | Objective: understanding the value of assessment in the learning process and the ability to provide constructive assessment in an ethical manner at various stages of the learning process and critically evaluate and analyze their understanding and practice regarding assessment Students can: • be well versed in a variety of assessment and feedback methods (for example, formative and final assessment) • apply pedagogical principles to determine and recognize the levels of educational competence of students | 4 | + | + | | + | | | | | | | | |
| 25 | | PD | | Pedagogical Approaches (pedagogical practice, 3rd | During this course, pre-service teachers go through a comprehensive professional development where they improve in practice their professional | 6 | | | | | | | | | | + | | + |

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| | | | | year)/dual | practices and develop their pedagogical and subject-specific competences necessary for a teacher (preschool teacher, primary school teacher, subject teacher, assistant class teacher / curator). | | | | | | | | | | | | | |
| 26 | Teacher as a Reflective Practitioner | BD | EC | Pedagogical Studies | Future teachers will be trained in the skills of searching and critical selection of theoretical knowledge from various reliable sources, the use of research results in the development of their pedagogical thinking and practice. They are willing to promote research-based learning and education, as well as their own continuous development and professional growth. | 5 | + | + | | + | | | | | | | | |
| 27 | | BD | EC | Action Research | Purpose: To develop a research component in the training of future teachers in the field of education. To assist future teachers in mastering the theoretical foundations of action research pedagogical methods and planning physics teaching processes based on scientific research.<br>Content: Strategy for the professional development of a modern teacher. The scientific method in education. Action research. Reflection on the results of one's own ideas. SMART goals. A reflective approach enabling future teachers to improve their | | | | + | | + | | | | | | | | + |

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| | | | | | teaching practice. Implementation of a value-oriented approach to teaching. Studying the value orientation of teachers. Key stages of action research. | | | | | | | | | | | | | |
| 28 | | BD | EC | Research, Development and Innovation of Physics | The goal is to develop research thinking and skills in developing, updating and applying innovative teaching methods and technologies in the context of changes in society and the educational environment. Content: The discipline aims to develop personal learning skills through research approaches, the use of critical thinking in data collection and analysis, participation in research projects and interuniversity collaboration. Students learn to document and present the results of their research activities using various forms of communication. Physical laws, the results of observations and experiments, and the application of scientific knowledge methods in real situations are also considered. | 4 | + | + | | + | | | | | | | | |
| 29 | | BD | EC | Lesson Study | The purpose of the "Lesson Study" subject is to form a system of joint research practice among future (or current) teachers aimed at step—by-step planning, conducting, observing and reflecting on lessons in order to continuously improve them and | | | | + | | + | | | | | | | + |

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| | | | | | improve the quality of student learning.<br>This course is aimed at research in action in the classroom, improving knowledge in the field of teaching practice.The study in volves groups of teachers working together to plan, teach, observe, and analyze learning and teaching, documenting their findings. During the Lesson Study cycle, teachers can introduce in novations or improve pedagogical approaches.<br>Lesson Study focuses on collaborative development and lesson improvement. | | | | | | | | | | | | | |
| 30 | | BD | HsC | Methods of Teaching Physics: Private Issues | The goal is to provide future physics teachers with the professional competencies necessary for effective teaching of a school physics course, taking into account modern requirements. During the training, students learn to combine knowledge of the content of the school curriculum with teaching methods, forms and technologies, to develop lessons, teaching methods and assessment. A scientific and methodological analysis of topics and sections of physics is conducted, the role of natural sciences in modern life, the essence of physical theories | 5 | | | | | + | | | | | | + | + |

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| | | | | | and laws, as well as the contribution of outstanding scientists to the development of natural science and the formation of a scientific picture of the world are examined. | | | | | | | | | | | | | |
| 31 | | BD | HsC | Digital Technologies in Education | Digital technologies of education is the introduction of students to the essence of digital technologies and artificial intelligence (AI), as well as their integration into the educational process. The study of modern digital tools: multimedia technologies, 3D technologies, virtual and augmented reality. The use of AI algorithms in education (educational data analysis, adaptive learning, automated testing). Development and use of high-quality digital educational resources with AI elements. The methodology of using digital technologies and AI to enhance the effectiveness and personalization of learning. Developed competencies: Knowledge of methods of using digital technologies and artificial intelligence in educational practice. The ability to develop, adapt and implement digital educational resources and intelligent systems to improve the educational process. | 3 | | | | + | | | | | | + | + | |

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| 32 | General Physics: Physical Laws in the Surroun ding World | PD | HsC | Mechanics | During the course, future teachers develop their competencies related to the use of modern theoretical concepts in mechanics and basic physical concepts, patterns, laws and theories, symbolism and terminology of physical science. They also develop their skills based on acquired theoretical knowledge, which allows them to creatively create and apply physical models to solve problems of studying the properties of mechanical objects. Future teachers develop their independent work skills, including learning algorithms, tools, and tools necessary to solve mechanics problems. | 6 | | | | | | | + | + | + | | | |
| 33 | | PD | HsC | Molecular Physics | During the course, future teachers will learn the basics of molecular kinetic theory and thermodynamics and basic physical concepts, patterns, laws and theories, symbols and terminology of physical science. They study the basic models of molecular physics, models and patterns of ideal and real gases, as well as the classical distribution of molecules. They also study thermodynamic methods, basic thermodynamic relations, and modern concepts in thermodynamics and molecular physics. | 6 | | | | | | | + | + | + | | | |
| 34 | | PD | HsC | Electricity and | During the course, future teachers | 5 | | | | | | | + | + | + | | | |

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| | | | | Magnetism | will learn about electrical, magnetic, and electromagnetic phenomena, as well as basic physical concepts, laws, laws and theories, symbols, and terminology of physical science. They develop a modern scientific approach to the nature of electric and magnetic fields, the electromagnetic field and the basic laws of electromagnetism. They also develop independent work skills, including learning the algorithms, tools, and devices needed to solve the problems of electricity and magnetism. | | | | | | | | | | | | | |
| 35 | | PD | HsC | Optics | During the course, future teachers get acquainted with physical phenomena related to the laws of light propagation and its interaction with matter, basic physical concepts and patterns, laws and theories, symbolism and terminology of physical science. They form their understanding of the basic concepts and laws of optics, as well as optical research methods. They also learn the skills of simple practical calculations. Future teachers also develop their skills in independent and experimental work related to solving problems in optics. | 5 | | | | | | | + | + | + | | | |
| 36 | | PD | HsC | Physics of the Atom, Atomic | The goal is to provide students with a holistic understanding of the | 5 | | | | | | | + | + | + | | | |

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| | | | | Nucleus and Solid Body | fundamental physical processes occurring at the atomic, nuclear, and solid–state levels, and to develop the ability to apply this knowledge in professional activities.<br>The course presents the physical theory of the atom as a generalization of observations, experience, and experiments expressed mathematically through the interrelationships of physical phenomena and quantities. Knowledge in the field of nuclear physics is being developed, which is necessary for scientific, industrial and design activities. The laws and phenomena of the microcosm, research methods of nuclear physics, the history and principles of nanotechnology, research of nanosystems and nanomaterials, their application, the impact of industrial activity on the environment, as well as parameters and possible ways of development of the Universe are considered. | | | | | | | | | | | | | |
| 37 | Research in Physics: Observation, Experim | PD | HsC | Workshop on Mechanics | During the course, future teachers study the theory and practice of modern laboratory practice using modern laboratory equipment and mathematical software. They develop their skills in creative execution and | 3 | | | | | | | + | + | + | | | |

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| | ent, Hypotheses | | | | application of physical models for laboratory work. They also develop the skills of independent work necessary to solve the problems of mechanics. After completing the course, they will be able to creatively apply physical models in laboratory work and independently solve mechanics problems. | | | | | | | | | | | | | |
| 38 | | PD | HsC | Workshop on Molecular Physics and Thermodynamics | During the course, future teachers acquire modern knowledge and practical skills of research work in the field of molecular physics and thermodynamics. They master the methods of scientific research in the field of molecular physics and thermodynamics. After mastering this course, they competently and critically select a theoretical model for the observed phenomena. | 3 | | | | | | | + | + | + | | | |
| 39 | | PD | HsC | Workshop on Electricity and Magnetism | During the course, future teachers practically get acquainted with the physical phenomena and laws of electromagnetism. They develop professional competencies and skills that allow them to formulate, create and apply physical models of electromagnetic phenomena to solve practical problems. A deep understanding of the concepts and laws of electromagnetism is achieved. | 3 | | | | | | | + | + | + | | | |
| 40 | | PD | HsC | A Workshop on | During the course, future teachers | 3 | | | | | | | + | + | + | | | |

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| | | | | Optics | observe the properties of light, find experimental confirmation of the laws of optics. They master the applied meaning of the laws under study and the practical application of the laws of optics. Performing laboratory work contributes to a deeper assimilation of optical knowledge and gives an opportunity to get acquainted with modern scientific equipment and the formation of skills for conducting a physical experiment. | | | | | | | | | | | | | |
| 41 | | PD | HsC | Workshop on the Physics of the Atom and the Atomic Nucleus | During the course, future teachers acquire the skills of experimental research of the main issues of atomic and nuclear physics using modern multifunctional laboratory complexes. Computer modeling is used to implement Rutherford's experiment on the scattering of alpha particles on atoms, to study Compton scattering and a number of other phenomena. | 3 | | | | | | | + | + | + | | | |
| 42 | Fundamental Physics | PD | EC | Methods of Mathematical Physics | During the course, future teachers study the basics of field theory and the necessary mathematical methods. They master the basic types of partial differential equations used in physical problems, including nonlinear equations, and some types of special functions of mathematical physics and their properties, the basics of the finite difference method. This course | 3 | | | | | | | + | + | + | | | |

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| | | | | | develops the skills of future teachers to build mathematical models of physical phenomena and analytical and numerical problem solving. | | | | | | | | | | | | | |
| 43 | | PD | EC | Special Functions and their Applications | To give the necessary theoretical material on the theory of special functions. Give the concept of generalized functions. Introduce applications of special and generalized functions. To introduce methods of computing special and generalized functions in computer mathematics systems. | | | | | | | | + | + | + | | | |
| 44 | | PD | EC | Theoretical Physics-1 | During the course, future teachers learn to create theoretical (primarily mathematical) models of phenomena in classical mechanics and electrodynamics, comparing them with reality as the main way to understand nature. Future teachers also study the historical aspect: the development of fundamental physics as a generalization of experimental laws, their transformation from an integral form into a differential one, the expression of physical content in the language of modern mathematics and the development of physical science as stages in the formation of fundamental theories: classical mechanics, thermodynamics, and Maxwell's electrodynamics. They will | 6 | | | | | | | + | + | + | | | |

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| | | | | | also learn about the role of fundamental interactions (strong, electromagnetic, weak and gravitational) in the physical representation of the world. | | | | | | | | | | | | | |
| 45 | | PD | EC | Theoretical Mechanics | Consideration of the general laws of the mechanical movement of bodies and their equilibrium, establishes general techniques and methods for solving issues related to this movement and equilibrium. To teach how to apply the methods of theoretical mechanics in solving physical problems related to motion. | 6 | | | | | | | + | + | + | | | |
| 46 | | PD | EC | Theoretical Physics-2 | During the course, future teachers will learn about the mathematical formulation of the laws of quantum and statistical phenomena observed experimentally. They also learn about theoretical physics as a unified science, the internal connections of which are established through analytical calculations or numerical calculations and comparison with experimental data. Future teachers study the description of fundamental physical laws in six areas of research | 6 | | | | | | | + | + | + | | | |
| 47 | | PD | EC | Physics of Micro-objects | Formation of students" ideas about the quantum-mechanical laws underlying modern physics and its fundamental applications in the study of one of the fundamental sections of | | | | | | | | + | + | + | | | |

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| | | | | | theoretical physics. The acquisition of theoretical knowledge and practical skills will allow students to independently solve specific physical problems in the physics of micro-objects | | | | | | | | | | | | | |
| 48 | Theory and Technologies of Teaching Physics | BD | EC | Workshop on Solving Physical Problems 1 | During the course, future teachers develop their competencies of forming the skill of solving physical problems, common approaches to solving any physical problem. | 4 | | | | | + | | | | | + | | + |
| 49 | | BD | EC | Physical Practice 1 | The discipline is aimed at the formation and constant control of the knowledge, skills and abilities of future teachers in the school physics course, which provides kinematics, dynamics, statics; mastering various methods of solving problems (analytical, graphical, experimental, etc.). | | | | | | + | | | | | + | | + |
| 50 | | BD | EC | Workshop on Solving Physical Problems 2 | This course contributes to a deeper study of the physics course through problem solving, the formation of methodological knowledge in solving physical problems. In the process of studying the course, they master the methods of studying various natural phenomena, get acquainted with new progressive ideas and views, with the discoveries of domestic scientists, with the achievements of domestic science and technology, with new | 5 | | | | | + | | | | | + | | + |

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| | | | | | professions. | | | | | | | | | | | | | |
| 51 | | BD | EC | Physical practice 2 | The discipline is aimed at the formation and constant monitoring of the knowledge, skills and abilities of future teachers in the school physics course, which provides for the basics of MKT, electricity and magnetism, optics; mastering various methods of solving problems (analytical, graphical, experimental, etc.). | | | | | | + | | | | | + | | + |
| 52 | | BD | EC | A School Physics Experiment | The course covers the basic physical phenomena and laws, through practical experiments. It includes sections of the general physics course: mechanics, molecular physics and thermodynamics, electricity, optics. Students conduct experiments, measure and analyze data, and understand physical principles. Develops the skills of observation, measurement, logical thinking. | 3 | | | | | + | | | | | + | | + |
| 53 | | BD | EC | Technique of the School Experiment | The course introduces students to the methods of planning, conducting and analyzing physical experiments. Covers the selection of equipment, measuring instruments, safety. Students master the skills of setting up experimental installations, data processing. Raises questions of accuracy, errors, interpretation of results. Develops the ability to systematize experimental research. | | | | | | | | | + | + | | + | |

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| 54 | | PD | | Industrial Practice (pedagogical, 4th year) | Purpose: preparation of students for professional pedagogical activity, familiarization with educational work at school and with advanced pedagogical experience.<br>Content: collecting information about the activities of an educational institution, the professional activity of a teacher. Analysis of regulatory documents defining the content of education according to the updated program. Familiarity with advanced teaching experience. subject teachers, methods of teaching mathematics and physics (observation and analysis of lessons, study of thematic and lesson plans of the teacher, the plan of elective classes and extracurricular activities. Work with an electronic journal and diaries of students. The use of digital and other modern technologies during classes. Conducting extracurricular educational work with students. | 10 | | + | | | | | | | | + | | + |
| 55 | Intersubject Interactions | PD | EC | Analytical Geometry and Linear Algebra | The purpose of the discipline is to form ideas about the theory of determinants, matrix analysis, and methods for solving systems of linear equations. Elements of set theory. Linear equation system. Determinants. Complex number. Scalar, vector, and mixed product of | 5 | | | | | | | + | + | + | | | |

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| | | | | | vectors and their applications. Method of coordinates on the plane. Second-order curves on the plane. Equations of a surface and a line in space. Second-order surfaces and their canonical equations. Mastering the mathematical apparatus of linear algebra for further use in the process of future scientific work. | | | | | | | | | | | | | |
| 56 | | PD | EC | Algebra and Number Theory | Teaching students fundamental methods of general algebra, linear algebra, number theory; familiarity with basic algebraic structures — groups, rings and fields. Mastering the mathematical apparatus of linear algebra and number theory for further use in the process of future scientific work. To develop students" analytical thinking and general mathematical culture. | | | | | | | + | | + | | + | | |
| 57 | | PD | EC | Mathematical Analysis | The purpose of mastering the discipline "Mathematical analysis" is to form the knowledge and ability of future specialists to apply mathematical apparatus and mathematical methods in the analysis of physical phenomena and processes. Limit of the numerical sequence. Limit, continuity, uniform continuity of the function. Fundamentals of differential calculus. Basic integration methods. A definite integral and its | 4 | | | | | | | + | + | + | | | |

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| | | | | | physical applications. Improper integral. Functions of many variables. Multiple integrals. has skills in using mathematical methods to solve physical problems | | | | | | | | | | | | | |
| 58 | | PD | EC | Mathematical Logic and Discrete Mathematics | Teaching methods for solving discrete mathematics problems. To give students a stock of basic knowledge on the main sections of discrete mathematics, to teach rational and effective use of the acquired knowledge in solving typical problems of discrete mathematics and mathematical logic; to form students" understanding of discrete mathematics and mathematical logic as methods of studying a wide range of objects and processes. | | | | | | | + | + | + | | | |
| 59 | | PD | EC | Astronomy | During the course, future teachers study basic information about the celestial sphere and coordinate systems, the structure of the Solar System and the phenomena occurring in it, the structure of our Galaxy, the structure of the Universe - initial information about astrophysics and methods of astronomical research. Future teachers also get acquainted with the history of the development of ideas about the Universe. They build their modern scientific understanding of the structure of the universe and | 3 | | | | | | | + | + | + | | | |

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| | | | | | the history of the development of astronomy. | | | | | | | | | | | | | |
| 60 | | PD | EC | Problems of Cosmology | The course includes basic questions about the structure, origin and evolution of the universe. The theories of the big bang, dark matter and energy, the formation of aggregates and cosmic structures are considered. Students study current research and philosophical aspects of cosmology, expanding their understanding of our place in the universe. | | | | | | | | + | + | + | | | |
| 61 | | PD | EC | Programming | During the course, pre-service teachers develop their understanding of the fundamental Python programming concepts. They also develop their algorithmic thinking skills as well as coding skills by using commonly used data structures, writing custom functions, and reading and writing results to files. | 5 | | | | | | | | + | + | + | | |
| 62 | | PD | EC | Computer Ggraphics | Acquaintance of students with modern principles of construction of graphic systems of two-dimensional and three-dimensional image transformation. Learn graphics algorithms. Master the methods of creating realistic three-dimensional images | | | | | | | + | | + | + | | | |
| 63 | | PD | EC | Project Approach in Scientific | During the course, students are grouped together to solve learning | 4 | | | | | + | | | | | | + | + |

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| | | | | Education | tasks together. Working in a team on a project, they gain experience that is as close as possible to their future profession. Future teachers are implementing a project to solve and identify a genuine scientific problem. They will learn how to develop a similar project for secondary school students. | | | | | | | | | | | | | |
| 64 | | PD | EC | Physics in STEM | The course offers a comprehensive study of physics in the context of a STEAM approach with the integration of artificial intelligence (AI) technologies. It includes the main topics: mechanics, thermodynamics, electricity and magnetism, optics and the basics of quantum physics. Special attention is paid to the use of AI for modeling physical processes, analyzing experimental data, and automating scientific research. Mastering STEAM and AI tools for the development of interdisciplinary educational projects and practical tasks. | | | | | | + | | | | | + | | + |
| 65 | | PD | EC | Educational Robotics and Mechatronics | The course is aimed at mastering the basics of educational robotics, mechatronics and artificial intelligence (AI) technologies for integrating science and technology into educational processes. It includes | 4 | | | | | | | | + | + | + | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | the study of architecture and programming of robots, mechatronic systems, as well as AI algorithms for control and automation. The focus is on students' project activities using robotics and AI, which contributes to the development of creative and engineering skills. The course examines methodological aspects of using robotics, mechatronics, and intelligent systems to create interactive educational projects and STEM lessons. | | | | | | | | | | | | | |
| 66 | | PD | EC | Physics and Sustainable Development Education | This course is an interdisciplinary study of physics in conditions of unstable development. Natural resources and technologies in the field of ecology, the interaction between social laws and environmental problems, as well as the application of physical laws for sustainable development are considered. The focus is on the analysis of modern energy and environmental problems, the study of energy sources, the efficient use of resources and the development of technologies to reduce the negative impact on the environment. | | | | | | | | + | + | + | | |
| 67 | | PD | EC | Electronics | During the course, future teachers develop their theoretical knowledge about the physical foundations of the | 4 | | | | | | + | + | + | | | |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | functioning of electronic elements, the principles of electronic devices, circuits and functional blocks of analog and digital electronics and microelectronics. They acquire practical skills in the field of physical experiment to calculate and study the characteristics of electronic devices. | | | | | | | | | | | | | |
| 68 | | PD | EC | Basics of Radio Electronics | The course is designed to study the processes and laws of signal conversion in circuits and systems, the formation of skills for calculating, developing and measuring parameters and characteristics of analog and digital electronic devices. It is assumed that students will consolidate their knowledge in the disciplines of discrete mathematics, methods of mathematical physics, electricity and magnetism. | | | | | | | | + | + | + | | | |
| 69 | Final Certification | PD | | Research and Innovation in Education | pre-service teachers' developmental approach towards their own professional activities and work environment. The course also emphasizes the development of pre-service teachers' collaborative, problem-solving and leadership skills. They deepen their pedagogical skills and develop research skills as well as practical skills (didactics) in accordance with their area of specialization. | 8 | | | | | | | | | | + | | + |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70 | | PD | | Writing and defending a thesis, graduation project, or preparing and passing a comprehensive exam | Selection of the research topic and planning of research work. Substantiation of the relevance of the chosen topic, setting the research goal, determining the object and subject of research. Formulation of the research hypothesis and definition of the main research objectives. Selection and study of the main literary sources. The expected results of the study. Drawing up a schedule of work on a thesis. Writing, registration and defense of a thesis | 8 | | | | | | | | | | | + | + |

## 5. SUMMARY TABLE REFLECTING THE VOLUME OF DISBURSED LOANS BY EP MODULES

| **Course of training** | **Semester** | **Amount of the mastered modules** | **Amount of the studied disciplines** | | | **Amount of KZ credits** | | | | | **Total in hours** | Total KZ credits | Amount | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Compulsory component** | **University component** | **Optional component** | **Theoretical training** | Physical education | Training practice | Production practice | Final attestation | | | **exam** | **Diff Offset** |
| 1 | 1 | 4 | 5 | | 2 | 30 | | | | 900 | 30 | 6 | 1 | 1 |
| | 2 | 5 | 4 | 3 | | 29 | 1 | | | 900 | 30 | 5 | 3 | |
| 2 | 3 | 6 | 2 | 4 | 1 | 29 | | | | 870 | 29 | 5 | 3 | 2 |
| | 4 | 6 | 1 | 3 | 3 | 29 | | 2 | | 930 | 31 | 5 | 3 | |
| 3 | 5 | 7 | 1 | 4 | 2 | 28 | | | | 840 | 28 | 6 | 1 | 3 |
| | 6 | 7 | | 5 | 2 | 29 | | 3 | | 960 | 32 | 6 | 2 | |
| 4 | 7 | 4 | | 1 | 6 | 34 | | 10 | | 1320 | 44 | 5 | 3 | 4 |
| | 8 | 1 | | | | | | 8 | 8 | 480 | 16 | | 1 | |
| total | | 14 | 13 | 20 | 16 | 208 | 1 | 23 | 8 | 7200 | 240 | 38 | 17 | 14 |

## 6. STRATEGIES, TEACHING METHODS AND ARTIFICIAL INTELLIGENCE, MONITORING AND ASSESSMENT

| | |
|---|---|
| **Learning strategies** | - Competence-based learning<br>- Constructive alignment<br>- Student-centred learning and active learning methodologies<br>- Research-based teaching<br>- Interdisciplinary learning<br>- Inclusion<br>- Teacher professional development and change management |
| **Teaching methods** | Conducting lectures, seminars, various types of practices with:<br>• the use of innovative technologies:<br>• problem-based learning;<br>• case study;<br>• work in a group and creative groups;<br>• discussions and dialogues, intellectual games, olympiads, quizzes;<br>• reflection methods, projects, benchmarking;<br>• Bloom's taxonomies;<br>• presentations;<br>• rational and creative use of information sources:<br>• multimedia training programs;<br>• electronic textbooks;<br>• digital resources.<br>•machine learning methods<br>Organization of independent work of students, individual consultations. |
| **Monitoring and evaluation of the achievability of learning outcomes** | Current control on each topic of the discipline, control of knowledge in classroom and extracurricular classes (according to syllabus).<br>Assessment forms:<br>• survey in the classroom;<br>• testing on the topics of the academic discipline;<br>• control works;<br>• protection of independent creative works;<br>• discussions;<br>• trainings;<br>• colloquiums;<br>• essays, etc.<br>Boundary control at least twice during one academic period within the framework of one academic discipline.<br>Intermediate certification is carried out in accordance with the working curriculum, academic calendar.<br>Forms of conducting:<br>• exam in the form of testing;<br>• oral examination;<br>• written exam;<br>• combined exam;<br>• project defense;<br>• protection of practice reports.<br>Final state certification. |

## 7. **EDUCATIONAL AND RESOURCE SUPPORT FOR EP**

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|---|---|
| **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.<br>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.<br>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 linkhttp://articles.ukgu.kz/ru/pps .<br>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».<br>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/ .<br>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-kitar», «Kitar.kz», etc.<br>For people with *special needs* and disabilities, the library website has been adapted to the work of visually impaired users. |
| **Material and technical base** | A material and technical infrastructure that complies with the **State Compulsory Educational Standard (SCES)** has been established to support the Bachelor's degree programme. The educational process is provided with classrooms, specialized laboratories, computer laboratories, and auxiliary facilities.<br>The Department of Physics is assigned 12 rooms (Rooms 215, 326–335, and 337) located in Building No. 7, with a total area of **576.86 m²**. Classrooms 327 (80.26 m²) and 337 (79.15 m²) are designated for lectures and practical classes. Room 334 (12.19 m²) serves as the faculty office, while Room 215 (35.0 m²) is used as an auxiliary facility. Computer laboratories are located in Room 333 (56.35 m²), equipped with 12 computers, and Room 335 (31.97 m²), equipped with 10 computers. Laboratory classes are conducted in specialized laboratories of Mechanics and Molecular Physics (Room 332), Electromagnetism (Room 330), Methods of Teaching Physics and Astronomy (Room 326), Optics (Room 329), and Atomic Physics (Room 328). Rooms 326, 329, 330, and 332 are equipped with interactive whiteboards.<br>Practical and research training of students is carried out in the specialized research laboratories of the university and at partner enterprises. During industrial and pre-graduation internships, students acquire practical skills in working with laboratory equipment, reinforce their theoretical knowledge, and develop professional competencies. |

**APPROVAL SHEET**

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