THE MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF KAZAKHSTAN

M.Auezov SOUTH KAZAKHSTAN STATE UNIVERSITY

«APPROVED BY»
The Rector
d.h.s., academician Kozhanazharova D.P.
«__» _____ 2023y.

EDUCATION PROGRAMME

6B01520 – Physics

Registration number	-
Code and classification of the field of education	6B01 Pedagogical sciences
Code and classification of training areas	6B015 Teacher training in science subjects
Group of educational programs	B010 Training teachers of physics
Type of EP	active
ISCE level	6
NQF level	6
SQF of education level	6
Form of study	Full time, Distance learning
The complexity of the EP, not less	240 credits
Distinctive features of EP	-
University Partner (JEP)	-
University Partner (TDEP)	-
Social Partner (DE)	-

Shymkent, 2023

Drafters:

Name	Position	Sign
Adyrbekova G.M.	Head of the Center for Management of Educational Programs, c.ch.sc, associated professor	
Tursynbayev A. Z.	Head of the Department of Physics, Candidate of Pedagogical Sciences	
Ortaeva K.A.	Candidate of Pedagogical Sciences, Associate Professor	
Baubekova G.M.	Master of Physics	
Sarsenbayeva Zhanar	Director of the Lyceum School No. 50 named after A. Baitursynov	
Shokibasov Aidar Shaueshovich	director of General Secondary School No. 44 named after B. Momyshuly	
Almakhanovna Raushan	director of it school-Lyceum No. 7 named after K. Sypatayev	
Ayubaeva Tolkyn Polatbaevna	director of school-Lyceum № 77 named after A. Askarov	
Sakhova Moldir Bekbosynovna	director of general secondary school No. 59	
Sabitova Nazym	is a student of the EP-20-2k group	
Amidullayeva Medina	is a student of the EP-20-2 K group	

The educational program was considered at a meeting of the academic committee on pedagogical sciences,

protocol No. 4a dated "10" 01 20__.

Chairman of the Committee _____ Urazbaev K.M.

Considered and recommended for approval at a meeting of the Educational and Methodological Council of SKU named after M. Auezov,
protocol No. 4 dated "22" 02 2023

Chairman of the EMC _____ Abisheva R.

Approved by the decision of the Academic Council of the University

protocol No. 13 dated "23" 02 2023

Approved by the decision of the Academic Council of the University
protocol №13 from «23» 02 2023

CONTENT

1. CONCEPT EP

Mission of the University	We are focused on generating new competencies, training a leader who translates research 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 to choose, develop and act. – Partnership - creates trust and support in a relationship where everyone wins. – **S**ocial 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 – Information and digital literacy and mobility – Research skills, creativity and emotional intelligence – Entrepreneurship, independence and responsibility for their activities and well-being – Global and national citizenship, tolerance to cultures and languages
Uniqueness of the EP	the program was developed in accordance with the Atlas of New Professions and Competencies, and is aimed at training competent specialists for transport and logistics and scientific and pedagogical structures who are able to organize and manage the activities of a structural enterprise, independently determine the goals of professional activity, choose and justify methods and means to achieve them. •
Academic Integrity and Ethics Policy	The University has taken measures to maintain academic integrity and academic freedom, protection from any kind of intolerance and discrimination: • Rules of academic integrity (Order No. 212-нқ dated 10.10.2022); • Anti-Corruption Standard (Order No. 221-нқ dated 07.12.2021). • Code of Ethics (order No. 212-нқ dated 10.10.2022). • Anti-Corruption Policy of the NJSC “M. Auezov South Kazakhstan University.” (order No. 144 пқ dated 07.14.2022).
Regulatory and legal framework for the development of EP	1. Law of the Republic of Kazakhstan "On Education" No. 319-III dated July 27, 2007; 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 3. State obligatory standards of higher and postgraduate education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated July 20.2022 No. 2; 4. Rules for the organization of the educational process on credit technology of training, approved by the Order of the Ministry of Education and Science of the Republic of Kazakhstan dated April 20, 2011 No. 152;

	5. Qualification directory of positions of managers, specialists and other employees, approved by the Order of the Minister of Labor and Social Protection of the Population of the Republic of Kazakhstan on December 30, 2020 No. 553. 6. Guidelines for the use of ECTS. 7. Guidelines for the development of educational programs of higher and postgraduate education, Appendix 1 to the order of the Director of the Central Research Institute No. 45 o/d dated June 30, 2021.
Organization of the educational process	– Implementation of the principles of the Bologna Process – Student-centered learning – Availability • Inclusivity
Quality assurance of EP	– Internal quality assurance system – Involvement of stakeholders in the development of the EP and its evaluation – Systematic monitoring • Updating the content (updating)
Requirements for applicants	They are established according to the Standard Rules of admission to training 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 dated 31.10.2018
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. An individual differentiated approach is provided for all types of classes and in the organization of the educational process.

2. EDUCATION PROGRAMME PASSPORT

EP objectives	Training of teachers capable of forming knowledge, skills and skills of intellectual, moral development of students' personality, demonstrating professional values.
EP tasks	- meeting the needs of the individual in intellectual, cultural and moral development through higher education; - preparation of bachelors, capable of adaptation and successful development of related areas of professional activity, as well as professional development, training in programs of additional education and continuing education in master's degree; - acquisition of competence and experience of creative activity in the field of physics, methods of teaching physics and education; - meeting the needs of society in qualified specialists in the field of education and training in physics, able to integrate academic values with entrepreneurial ideas; - providing conditions for the acquisition of a high General intellectual level of development, mastering competent and developed speech, culture of thinking and skills of scientific organization of labor in the field of education; - formation of socially responsible behavior in society, understanding the importance of professional ethical standards and following these standards; - creation of conditions for intellectual, physical, spiritual, aesthetic development of the individual to ensure the possibility of their employment in the specialty.
OP Compatibility	• 6th level of the national qualifications framework of the Republic of Kazakhstan; • Dublin Descriptors 6th qualification level; • 1st cycle of the qualifications framework of the European Higher Education Area (A Framework for Qualification of the European Higher Education Area); • Level 6 of the European Qualification Framework for Lifelong Learning.
Communication of the EP with the professional sphere	Appendix to the order of the Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" dated June 8, 2017 No. 133 was approved by the standard of a professional teacher.
Name of the degree awarded	After successful completion of this EP, the graduate is awarded a bachelor's degree in natural sciences in the educational program "6B05310-Physics".

List of qualifications and positions	A graduate in the educational program "6B01520-Physics" is awarded a bachelor's degree in education with the opportunity to hold the following positions: teacher without a category, teacher-trainee, teacher, teacher of the 2nd level, teacher of the 1st level, teacher-moderator, high-level teacher, teacher-expert, teacher of secondary education, methodologist, instructor, tutor, teacher, team leader, deputy head of the institution, head of the structural unit, adviser. Qualification guide for 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 May 21, 2012 No. 201-O-M.
Sphere of professional activity	Focused on research and educational activities. The area of professional activity is the area - research activities in the field of experimental, theoretical and applied physics, as well as related natural and technical sciences; - design-technological, production-technological and industrial-production; - field of knowledge; - information centers, national companies and centers.
Forms of professional activity	- research and design institutes, laboratories, design and design bureaus and firms; - industrial enterprises and associations; - science-intensive industries; - organizations and enterprises of education; - can continue his studies in the magistracy in higher educational institutions.
Subjects of professional activity	The professional disciplines of the bachelor of EP 6B01520-Physics include: - the education system, their value-target directions, content, methods, forms and results; -research, innovative, information and analytical systems of physics, mathematics, their teaching methods, pedagogy, psychology.
Types of professional activity	A bachelor by specialty of 6B01520 – Physics can do the following types of professional activity: – educational; – pedagogical; – teaching-educational; – educational and technological; – organizational-methodical. – research;
learning outcomes	LO1.Communicate freely in the professional environment and society in Kazakh, Russian and English, observing the principles of academic writing and the culture of academic honesty.

	LO2. Demonstrate socio-cultural, professional development based on the formation of ideological, civic, spiritual and social responsibility, methods of scientific and experimental research. LO3. Possess information and computational literacy, the ability to generalize, analyze and perceive information, setting goals and choosing ways to achieve it. LO4. Make lesson plans and conduct them taking into account the characteristics and needs of students, defining appropriate teaching methods and assessment tools. LO5. Manage the behavior of students, motivating their educational and cognitive activity, based on the methodology of educational work and modern concepts of education. LO6. To carry out pedagogical activities in educational institutions, taking into account the characteristics and needs of students, the patterns of their age and individual development. L7. To carry out research work on the methodology of teaching physics, based on current trends in its development and involving students in this activity. LO8. Explain the laws and theories of physics and astronomy, applying them to solve problems in professional activity and in everyday life. LO9. Solve practical problems and problems of physics using mathematical apparatus and methods of statistical data analysis. LO10. Perform professional and pedagogical functions to ensure effective organization and management of the pedagogical process in teaching physics LO11. To use theoretical and experimental methods to study processes in physics and astronomy, and to construct their mathematical and physical models of LO12. The ability to work in a team, plan and implement professional continuing education in formal, informal, and informational forms.

3. COMPETENCES OF EP GRADUATE

General Competencies (SOFTSKILLS): Behavioral Skills and Personal Competencies	
SS 1. Competencies in managing one's own literacy (self-learning and systems thinking, openness, cross-functionality)	SS 1.1. The ability to self-education, self-development and constant updating of knowledge on the chosen trajectory and in an interdisciplinary environment. SS 1.2. The ability to express their thoughts, feelings, facts and opinions in the professional field .. SS 1.3. Mobility and critical thinking in the modern world.
SS 2. Language competence	SS 2.1. Ability to create communication programs in the state, Russian and foreign languages. SS 2.2. Ability to interpersonal social and professional communication in terms of intercultural communication.

SS 3. Mathematical competence and competence in the field of science	SS 3.1. The ability and willingness to use the educational potential, experience and personal qualities acquired in the course of studying mathematical, natural science, technical disciplines at the university in solving professional problems.
SS 4. Digital Competence and Technology Literacy	SS 4.1. The ability to demonstrate and develop information literacy through the development and use of modern information and communication technologies in all spheres of life and professional activity. SS 4.2. Ability to use various types of information and communication technologies: Internet resources, cloud and mobile services for searching, storing, protecting and disseminating information.
SS 5. Personal, social and learning competencies	SS 5.1. The ability to physical self-improvement and focus on a healthy lifestyle to ensure full-fledged social and professional activities using the methods and means of physical culture. SS 5.2. Demonstrate knowledge of the culture and traditions of the peoples of Kazakhstan, pedagogical ethics, fundamentals of the legal system and legislation of Kazakhstan and trends in the social development of society. SS 5.3 The ability to build an individual educational trajectory throughout life for self-development, career growth and professional success. SS 5.4. The ability to successfully interact in a variety of all socio-cultural contexts during study, work, at home and in free time.
SS 6. Entrepreneurial competencies	SS 6.1. The ability to be creative and businesslike in various environments. SS 6.2. The ability to work in a mode of uncertainty and in a rapidly changing goal, make decisions, allocate resources and manage your time. SS 6.3. Ability to work with consumer requests.
SS 7. Ability for cultural awareness and self-expression	SS 7.1. Ability to show worldview, civil and moral positions. SS 7.2. The ability of the world to be tolerant of the traditions, culture of other peoples, to have high spiritual qualities. SS 7.3. ability to interpersonal social and professional communication in the conditions of intercultural communication.
Professional competencies (HARDSKILLS) relevant, special theoretical knowledge and practical skills, skills for this area of training	
Relevant, special theoretical knowledge and practical skills, skills for this area of training	PK1. The ability to demonstrate professional values (commitment to the profession of a teacher, citizenship, compliance with professional ethics, responsibility, proactivity).
	PK2. The ability to apply modern teaching methods and assessment tools of students in the learning process
	PK3. The ability to plan and implement the educational process, creating a favorable environment and evaluating the achievements of students in interaction with all participants in the process.
	PC 4. The ability to independently master and apply specialized knowledge in the field of physics and other sciences to solve an applied problem.
	PC 5. The ability to use professional profile knowledge about information technologies, modern computer networks, software

	products and Internet resources to solve problems in the field of experimental and applied physics, processing experimental results.

3.1 Matrix of correlation of EP learning outcomes in general with modules formed by competencies

	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11	LO12
SS1		+			+	+						+
SS 2	+											
SS 3				+								
SS 4			+			+				+	+	
SS 5			+	+	+	+	+					
SS 6	+									+		
SS 7		+			+						+	
SS 8												
PC 1			+	+								+
PC 2			+	+					+			
PC 3				+							+	
PC 4				+			+	+	+			
PC 5			+				+	+	+			

4. Matrix of impact on the formation of educational results of disciplines and data on labor intensity

	Module name	CYCLE	HSC/ES	Component Name	Brief course description	Number of credits	Formed PO (codes)											
							LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11	LO12
1	Fundamentals of the Public Sciences	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. **Content:** 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 description for analyzing the causes and consequences of events in the history of Kazakhstan.	5		v				v						
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	5		v				v						

					introspection and moral self-regulation. **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" is a new Kazakh philosophy													
3	Module of Socio-Political Knowledge	GED	OC	Social and Political Studies	**Purpose:** formation of knowledge about socio-political activity, explanation of socio-political processes and phenomena. **Content:** Consideration of social and ethical values of societies. Understanding the peculiarities of social, political, cultural, psychological institutions in the context of their role in the modernization of Kazakh society. Making decisions to resolve conflict situations in society, including in professional society. Research of political institutions and processes,	4		v	v										

					methods of analysis and interpretation of ideas about politics, government, the state and civil society, to understand and apply methods and techniques of sociological, comparative analysis, to understand the essence and content of the political situation in the modern world. Analysis and classification of the main political institutions													
4		GED	OC	Cultural Studies and Psychology	**Purpose:** formation of scientific knowledge of history, modern trends, current problems and methods of development of culture and psychology, skills of system analysis of psychological phenomena. **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 XVIII – XIX centuries, XX century. Cultural policy of Kazakhstan. The State Program "Cultural Heritage". National consciousness, motivation. Emotions, intelligence. Human will, psychology of self-regulation. Individual typological features. Values, interests, norms are the spiritual basis. The meaning of life, professional self-determination, health. Communication of individuals and groups. Socio-psychological conflict. Patterns of behavior in conflict	4		v	v										

5	Socio-ethnic Development	GED	HsC	Ecosystem and Law	**Purpose:** formation of integrated knowledge in the field of economics, law, anti-corruption culture, ecology and life safety, entrepreneurship, methods of scientific research. **Content:** fundamentals of safe interaction between man and nature, productivity of ecosystems and the biosphere. Entrepreneurial activity in conditions of limited resources, increasing the competitiveness of business and the national economy. Regulation of relations in the field of ecology and human life safety. Knowledge and observance of Kazakhstan's law, obligations and guarantees of subjects, state regulation of public relations to ensure social progress. Application of scientific research methods.	5		v				v						
6		BD	EC	Abai Studies	**Purpose:** preservation of the "national code" in the project "Kazakhtanu" based on the creativity of A.Kunanbayev **Content:** historical overview of the history of Kazakhstan and Kazakh literature of the XIX-XX centuries. Studies of Abai's legacy of the XX-XXI century. Chronology of Abai's creativity. Abai is a great poet, ethnographer, founder of Kazakh written literature. Abai is the compiler of the code of laws "The Position of Karamola", social significance. Abai is a thinker, religious scholar, philosopher. The role	3		v				v						

					of Abai in education and science, the concept of a "Holistic person". "Words of Edification" by Abai, an epic novel by M.Auyezova "The Way of Abai". K. Tokayev "Abai and Kazakhstan in the XXI century", role, significance.													
7				Muhtar Studies	**Purpose:** to form a historical, literary idea of M. Auezov's work in the context of literary history, patriotism and cultural and spiritual position. Development of artistic thinking, skills of independent research activity. **Content:** The discipline of mukhtartan is one of the fundamental branches, which is diversified and growing nowadays. The creativity of M. Auezov pursues a great goal- to systematically teach and demonstrate deep content. One of the main objectives of the Mukhtar studies course is to master this spiritual wealth, to create good.			v				v						
8				Actual Problems and Modernizati on of National Awareness	**Purpose:** to restore spirituality deformed during the tsarist and Soviet periods, to form a creative personality based on the modernization of the public consciousness of young people. **Content:**spiritual modernization: origin and prerequisites. Modern national identity. Pragmatism and competitiveness. National identity and national code. Experience and prospects of evolutionary development. The triumph of knowledge and		v	v				v						

					openness of consciousness. Alphabet reform: experience and priorities. The fatherland is the foundation of the state. Education through national sacred places and history. Modern Kazakh culture is the cornerstone of spiritual revival. New humanitarian education and the future national intelligentsia. Abai Kunanbayev and the Kazakh society.															
9				Service to Society	**Purpose:** formation of socially significant skills and competencies based on the assimilation of academic programs, carrying out socially useful activities related to the disciplines studied at the university. **Content:** Service to society" is a mature enough discipline at our university. When teaching this discipline, students master four main areas: ecology, volunteering, social, charitable. "Service to society" is the basis of the program "Rukhani zhangyru". Serving society is choosing the position of "helping", extolling kindness in the world, filling the world with wisdom and love, responding to the needs and sorrows of people with disabilities.		v	v												

10				Foundations of Anticorrupsh ion Culture	**Purpose:** formation of an anti-corruption worldview, strong moral foundations of the individual, citizenship, sustainable skills of anti-corruption behavior. **Content:** overcoming legal nihilism, formation of the foundations of the legal culture of students in the field of anti-corruption legislation. Formation of a conscious perception, attitude to corruption. Moral rejection of corrupt behavior, corrupt morality, ethics. Mastering the skills necessary to counter corruption. Creating an anti-corruption standard of conduct. Anti-corruption propaganda, dissemination of ideas of legality, respect for the law. Activities aimed at understanding the nature of corruption, awareness of social losses from its manifestations, the ability to defend one's position in a reasoned manner, to look for ways to overcome corruption		v	v											
11	Commu nication and Physica l Trainin g	GED	OC	Kazakh (Russian) language	**Purpose:** formation of communicative competence using the Kazakh (Russian) language in the socio-cultural, professional sphere and public life, improvement of the ability to write academic texts. **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 communication situations of international standard: social, social,	10	v	v	v									

					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 the development of critical thinking.													
12		GED	OC	Foreign Language	**Purpose:** the formation of intercultural and communicative competence of students in the process of foreign language education at a sufficient level A2 and the level of basic **Content:** levels A1, A2, B1, B2 are 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 the development of critical thinking.	10	v	v	v									
13		GED	OC	Physical training	**Purpose:** 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 to prepare for professional activity; to withstand physical exertion,	8	v				v	v						

					neuropsychic stresses and adverse factors in future work. **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.														
14		BD	HsC	Professional Kazakh (Russian) Language	**Purpose:** to provide professionally oriented language training of a specialist who is able to adequately build communication in professionally significant situations and who knows the norms of the language for special purposes. **Content:** Professional language and its components. Professional terminology as the main feature of scientific style. Scientific vocabulary and scientific constructions in the educational and professional and scientific and professional spheres. The algorithm of work on the analysis and production of scientific texts in the specialty. Production of scientific and professional texts. Fundamentals of business communication and	3	v												

					documentation in the framework of future professional activity.													
15		BD	HsC	Professionally Oriented Foreign Language	**Purpose:** to form a communicative competence that will be able to apply a foreign language in professional activities and everyday communication. **Content:** basic concepts and terms of the specialty, systems of pragmatic units of the speech level; describes the skills and abilities of writing and defending educational and scientific work in the specialty, the content of the school course of mathematics and physics in a foreign language; discusses the use of special professionally-oriented material; analyzes texts in a foreign language; provides examples of the use of a foreign language in professional the possibilities of a foreign language as a source of expanding their linguistic, cognitive and pragmatic competencies are revealed.	3	v											
16		GED	OC	Information and Communication Technologies	**Purpose:** formation of the ability to critically evaluate and analyze processes, methods of searching, storing and processing information, methods of collecting and transmitting information through digital technologies. **Content:** Introduction and architecture of computer systems. Software. Operating systems. Human interaction with computers. Database systems. Database management.	5			v									

					Networks and telecommunications. Cyber defense. Internet technologies. Cloud and mobile technologies. Multimedia technologies. Smart technologies. Electronic technologies. Electronic business. Electronic control.													
17	Basics of Pedagogical Skills	BD	HsC	Pedagogy and Cyberpedagogy	**Purpose:** formation of readiness for systematic design and construction of the educational process in distance learning based on information technologies that ensure a rational, effective and comfortable educational process. **Content:** introduces modern methods of teaching and upbringing of the younger generation and the development of abilities, educational skills. Examines modern cyberspace and its impact on the consciousness and behavior of young people. Forms skills in mastering modern information computer and digital learning technologies, pedagogical cyber technologies. Characterizes the cybersecurity of students, the creation of immunity of students to the negative influences of cyberspace	5				v	v	v						
18		BD	HsC	Inclusive education	**Purpose:** preparation for the organization of educational activities with special needs using inclusive technologies **Content:**examines the models and legal foundations of the organization of inclusive education. Studies the conditions for organizing inclusive education for various categories of	4		v			v	v						

					children with disabilities. It characterizes the inclusion of children with sensory, motor, intellectual disabilities, emotional and volitional spheres in the educational process. Introduces the organization of psychological and pedagogical support for children with disabilities. Instills critical thinking skills in managing inclusive processes in education.													
19		PD	HsC	Workshop of Special Disciplines	**Purpose:** to develop students' skills and abilities to solve problems of qualification testing, based on basic knowledge Content: in the discipline, methods for solving typical problems **Content:** in the discipline, methods of solving typical problems of qualification testing in the field of physics are considered; the application of the laws of physics to solve practical problems is shown, examples of drawing up and solving problems are given. The ways of adaptation of students to the solution of problems arising in the daily life of the subject of physics by substantiating practical actions are considered.	4		v		v								
20		BD	HsC	Pedagogical practice	**Purpose:** development of general cultural and improvement of professional competencies of students. **Content:** familiarization of students with the school, class and organization of educational work with students; collection of information about the activities of educational institutions, professional activities of teachers;	1				v	v	v						

					analysis of the structure and content of state mandatory standards, standard programs of the subject; regulatory documents defining the content of education according to the updated program; familiarization with various types of extracurricular activities; analysis of educational work of the class teacher; attendance of classes and events held by the class teacher; preparation of a report													
21	Fundamentals of Psycho-Pedagogical Sciences	BD	HsC	Fundamentals of General and Age Psychology	**Purpose:** the development of psychological thinking of students based on the study and assimilation of knowledge of various mental phenomena, taking into account the age characteristics of the development of the human psyche. **Content:** introduction to psychology. Conscience. Personality. Activity. Cognitive processes. Psychology of will, emotions, feelings. Temperament. Personality. Abilities. Structure, functions, patterns of the psyche, cognitive processes, conditions, factors, mechanisms of development of the psyche in ontogenesis. Methodological foundations of age psychology, concepts, categories, mechanisms, nature of age transformations. Features, causes and factors, conditions and prospects of positive personality development at different age stages of human psyche development.	4		v				v						
22		BD	HsC	Physiology	**Purpose:** to teach future teachers to	4		v				v						

				of Schoolchildren Development	know the age-related anatomical and physiological features of the body of children and adolescents and to give an idea of the ways of forming a healthy lifestyle. **Content:** knowledge and understanding of the basic dimensions of ontogenesis, theories and provisions of the physiology of the development of schoolchildren: the development of the musculoskeletal system, nervous, sensory, endocrine, cardiovascular, respiratory, digestive, excretory system, social factors of children's development and their application in solving problems, formulation, execution, analysis and formulation of conclusions when performing practical work in a group and individually.												
23		BD	HsC	Theory and Methodology of Educational Work	**Purpose:** formation of professional and pedagogical competence of future teachers in the knowledge of the basics of the educational process, technology of organization and implementation of educational activities. **Content:** knowledge and understanding of general issues of the theory and methodology of education; basic theory of education and personal development; laws and principles, forms and methods of education the ability to identify current problems of modern theory and practice of education; the ability to educate and self-education; to form a motivational and methodological readiness for the	4		v				v						

					implementation of educational activities.													
24		BD	HSC	Psycho-pedagogical practice	**Purpose:** to introduce the student to the social environment of the educational organization in order to acquire the competencies necessary for successful adaptation to the profession of a teacher. **Content:** familiarization with the methodology of studying the psychological and pedagogical characteristics of the student team; participation in the psychological and pedagogical analysis of the lesson (educational event) of the psychological and pedagogical study of the class and individual students; familiarization with the structure of psychological observation and ways of interaction of the teacher with the subjects of the pedagogical process; analysis and planning of the educational process in psychological aspects; conduct evaluation of the results of the educational process and carry out its reflection.	1					v	v					v	v
25	Basis of Preparation of the Subject	BD	EC	Mechanics	**Purpose:** understand the basic theory, formula, laws of mechanics. **Content:** the discipline defines the basic concepts of classical mechanics – space, time, movement, speed, acceleration, mass, force, momentum, moment of force and momentum – for solving actual problems in physics of planetary motion; application of the principles of mechanics and the laws of	5				v			v						

					conservation of momentum, the use of angular momentum and moment of energy to describe the moment of momentum and movements of bodies.													
26		BD	EC	Experimental Mechanics	**Purpose:** to familiarize with the most common methods and methods of solving typical problems in mechanics, which give students relevant practical skills. **Content:** this course has a practical focus and implements a mechanical approach through demonstrations, experiments, and computer experiments conducted at home and in the classroom. It discusses the methodology of the experiment and the processing of its results; the laws of mechanics are stated and experiments are analyzed that have practical application in various branches of mechanics.					v			v					
27		BD	EC	Molecular Physics	**Purpose:** study of the physical properties of systems, the states and processes in which are determined by molecular motion and intermolecular interactions. **Content:** the course covers the basics of molecular kinetic theory of gas, the basic models of molecular physics and their laws, statistical laws of macrosystems; assesses the basic parameters of thermodynamic systems, analyzes the solution of problems, laboratory work and practical application of the laws.	7				v			v					
28		BD	EC	Thermodyna	**Purpose:** to master the basic concepts					v			v					

				mics and Kinetics	and laws of molecular physics, their mathematical formulation, to know the limits of applicability of the laws of molecular physics. **Content:** the discipline deals with the equilibrium properties of macroscopic systems, the beginning of thermodynamics and their consequences and their practical application, the use of thermodynamic potentials in specific problems of equilibrium theory; problems related to the chemical equilibrium of reactions in a gas mixture and solutions are solved, the rate of simple chemical reactions is determined.													
29		BD	EC	Electricity and Magnetism	**Purpose:** to study the section of physics covering knowledge about static electricity, electric currents and magnetic phenomena. **Content:** the discipline deals with the basic concepts of electromagnetism: charge, electric and magnetic field, their strength and potential, current, electromagnetic oscillations and waves; the evaluation of the main parameters in the interaction of substances with electromagnetic fields and the application of the laws of electromagnetism to solve practical problems.	6				v			v					
30		BD	EC	Electromagnetism in Practice	**Purpose:** to master the basic concepts, laws, their mathematical formulation. **Content:** the discipline deals with electromagnetic fields, electromagnetic radiation, acoustic analogues,					v			v					

					electromagnetic forces and energy; analyzes the solution of problems, methods of experiments; explains the practical applications of electromagnetic phenomena: wire, wireless, optical communication, circuits of electromagnetic devices, microwave communication, radar, antennas, generators, motors and sensors, optical devices and power transmission.													
31		BD	EC	Optics	**Purpose:** to master the basic concepts, laws, their mathematical formulation **Contents:** the discipline considers the main experimental results in the field of optical phenomena; the basic laws of geometric and wave optics, methods of solving problems of optics, principles of operation and the device of modern experimental equipment for the study of optical phenomena and matter using optical methods.	5				v			v					
32		BD	EC	Applied Optics	**Purpose:** to master the basic concepts, laws, their mathematical formulation **Contents:** the discipline considers the basics of modern optics; shows the basic principles of construction and operation of simple optical systems; provides examples of determining the characteristics of the optical system and assess the impact of the optical system on the formation of the image.					v			v					
33		BD	EC	Physics of the Atom and the Atomic	**Purpose:** to study the structure of the atom, to be able to solve problems on all topics of sections of atomic physics and nuclear physics.	5				v			v					

				Nucleus	**Content:** the discipline deals with the basic concepts of atomic, nuclear physics and elementary particle physics; analyzes the experimental methods of atomic and nuclear physics; explains the use of the laws of atomic and nuclear physics in solving practical problems and laboratory work.													
34		BD	EC	Introduction to Applied Nuclear Physics	**Purpose:** to study the structure of the atom, the structure of the electron shell, the definition of the terms isotope and isotone. **Content:** the discipline considers the main provisions and concepts in the field of nuclear physics and elementary particle physics, the main phenomena and processes in microphysics, their role in the evolution of the Universe; the possibility of applied use of these phenomena and processes; the structure of the nucleus, the laws of radioactive decay and nuclear reactions, the basic properties of elementary particles and the interaction of particles.					v			v					
35		PD	EC	Astronomy	**Purpose:** to give students a deep explanation of the basic laws of mechanical motion of the celestial bodies in question, to teach them to master the theoretical and practical ways of studying astronomical phenomena and independently apply their knowledge in practice, to deepen the study of the basic laws of mechanical motion of the celestial bodies in question, to teach students to master the theoretical and practical	4				v			v					

					ways of studying astronomical phenomena and to apply the knowledge in practice independently. **Contents:** in the discipline describes the evolution ideas about the structure and development of the Universe; astronomical methods research and their role in the knowledge of the structure and the dynamics of evolutionary processes in the Universe; it explains the device astronomical instruments and the solution of problems of practical astronomy.														
36		PD	EC	Astrophysics	**Purpose:** mastering theoretical and practical research methods of astrophysical phenomena and the ability to apply the received knowledge in practice, mastery of theoretical and practical techniques of the study of astrophysical phenomena and the ability to apply this knowledge in practice. **Contents:** the discipline describes galactic, non-galactic astronomy; the formation and evolution of galaxies; analyzes the principles of cosmology and cosmogony; examines the birth, life, death of stars; outlines modern ideas about the origin; explains the origin of planets and life in the Universe; and the solution of problems of practical astrophysics.				v			v					

37		BD	HsC	Educational Practice	**Purpose:** to introduce the student to the areas of activity of the higher educational institution, the educational programs implemented by him, OP "Physics", functions and tasks of future professional activity. **Content:** during the internship, the student gets acquainted with the organization of the activities and management of the University, with the main regulatory documents regulating activities in the field of education (documents of the Ministry of Education of the Republic of Kazakhstan, Professional standard, SES, OP, standard programs and syllabuses of disciplines, the work plan of the department, the individual plan of the teacher); studies the activities of the teacher, methods of planning and analysis of the educational process the process of the department, the material and technical equipment of the department, the scientific directions of the work of the teachers of the department.	1		v	v									
38	Fundamental Courses of Higher Mathematics	PD	EC	Mathematical Analysis	**Purpose:** to develop students ' skills in conducting classical fundamental training in mathematical analysis, using the apparatus of mathematical analysis in the study of other mathematical disciplines. **Contents:** the discipline presents an introduction to analysis, indefinite and definite integral, concepts and differential calculus of functions of	5		v		v								

					many variables, methods for calculating double, triple, curvilinear and surface integrals. The basic concepts of numerical, functional and power series are given.															
39		PD	EC	Analytic Geometry	**Purpose:** to introduce the basic concepts and methods of modern analytic geometry. **Content:** Knowledge and understanding of the basic concepts of analytical geometry. Understanding the elements of vector algebra on the plane and in space, different ways to set the line. Know and understand lines and second-order equations, various ways of specifying a plane. Study of second-order equations from canonical equations.			v		v								
40		PD	EC	Theory of Probability and Mathematical Statistics	**Purpose:** to study the patterns of random events and random variables, properties and basic operations on them; elements of statistics. **Content:** know and understand of the basic concepts and theorems of probability theory, elements of mathematical statistics. Knowledge and understanding of concepts of random events and their probability, properties of probability, elements of combinatorics. Ability to use basic formulas to solve problems of probability theory.	4		v		v								
41		PD	EC	Differential and integral equations	**Purpose:** basic concepts and methods for solving differential equations. Applications of methods of ordinary differential equations in physics,			v		v								

					engineering. **Contents:** the discipline deals with differential equations, differential equations of the first order, integrable problems in quadratures; Forbidden derivative equations, high-order differential equations that can be reduced in order; linear homogeneous and non-homogeneous high-order differential equations are written. The main methods for integrating systems of differential equations, some methods for solving integral equations are given.													
42	Methodical Basics of Teaching Physics	BD	EC	Introduction to Specialty	**Purpose:** to form students' understanding of the methods of studying mathematics and physics, showing their application in solving practical problems. **Content:** the subject describes the subject and tasks of physics, the laws in the development of physics, the connection of physics with production, the connection of the development of physics with the development of other sciences, describes the main methods of knowledge at the empirical and theoretical level, analyzes and evaluates the current problems and development prospects of physics, directions of research work of the Department of Physics is considered.	4				v			v		v			

43				Fundamentals of Academic Writing	**Purpose:** "Academic writing" - formation of professional competence and expansion of communicative competence related to analytical textual activities; formation of students ' linguistic and pragmatic thinking skills, ability to analyze expressive units of the language and competently choose the necessary unit depending on the goals and conditions of communication. **Content:** fundamentals of academic writing - increasing the level of students' writing skills in the Kazakh language in accordance with the requirements of the academic text. The language of the academic text, the observance of the ways of using language units in it. In the Fundamentals of Academic Writing, students learn: in each subject, students use academic notes to convey ideas, create evidence, and participate in scientific interviews. Academic writing is characterized by persuasive arguments, specific word choice, logical organization, and personal tone.													
44		PD	HsC	Teaching and Assessment in Physics	**Purpose:** to acquaint students with the basics of the professional activity of a physics teacher **Content:** in the process of learning and assessment in physics, students ask: "why am I studying?" - answering the question, they formatively evaluate each of their steps, their success. So there is a desire to learn, interest, love	6												

					for the subject, trust in the teacher. Assessment for learning is an assessment of where students are in their learning, in which direction they should progress and how to reach the required level. The ability of students to comprehensively and fairly evaluate the progress made by each student in achieving the expected result in learning, increasing interest in educational education.													
45		PD	HsC	Educational and methodical (pedagogical) practice	**Purpose:** to establish links between theoretical knowledge gained in the study of social, psychological, pedagogical and special disciplines and practice. **Content:** familiarization of students with the school, the class and the organization of educational work with students; attendance of lessons and educational hours of teachers in a fixed class; conduct psychological and pedagogical analysis of the lesson; conduct lessons on the subject, applying interdisciplinary knowledge (in pedagogy, psychology, methodology and other disciplines); create and select for the classes didactic materials using modern digital, smart and stem technologies, learning strategies; compilation of psychological and pedagogical characteristics of the student's personality; preparation of a report reflecting the results of educational activities.	2												

46	Modern Problems of Education	PD	EC	Computer Methods in Physics	**Purpose:** students 'in-depth development of numerical methods for solving physical problems and mastering the skills of their independent implementation on personal computers (PCs). **Content:**The discipline deals with a General understanding of the programming environment MATLAB; formatting two-and three-dimensional graphs; working with graphs and building special graphs MathCAD and MATLAB; animation and analysis of physical phenomena in the MATLAB; solving physics problems in Pascal, in the programming environment.	6							v	v	v			
47		PD	EC	Modeling of Physical Processes	**Purpose:** to develop practical skills in programming basic mathematical algorithms used in solving physical problems and processing experimental data, ways to implement them effectively on a computer, and estimation of the error of the results of the tasks used in modeling physical phenomena. **Content:** the discipline describes methods of constructing mathematical models of physical phenomena, their qualitative analysis, development of algorithms for solving equations; visualization and work with packages for modeling molecular dynamics; principles of computer experiment and analysis of its results; problem solving using software packages.								v	v	v			

48				New Approaches to Teaching Physics	**Purpose:** training specialist, who understand the problems and trends of development of modern education; knowledgeable of modern methods and technologies for diagnosis and assessment of the quality of the educational process; able to design forms and methods of control of quality of education and develop different types of test materials, including on the basis of information technologies and foreign methodical teaching experience; able to use this knowledge in professional activities to improve the educational process. **Content:** since the meaning of "methodology" comes from the word "method", the concept of "teaching method" considers several ways of new methods of teaching physics. They are complex method, project method, deductive and inductive method, etc. Just as physical science has its own research method, physics teaching has its own method. Teaching methods with learning methods. Experiment is the main method in physics lessons. Enriching the lesson content of physical science with new data, implementing problem-based methods of teaching, transforming teaching methods and methods, strengthening students' independent work, creating interesting experiments, physical focuses, schemes, graphs, etc. the use of it will invigorate teaching. The	5												

					currently used teaching methods are mainly divided into three groups: 1. Method of oral explanation. 2. Visual method. 3. Proactive method.													
49				Methods of Teaching Natural Science Disciplines in a Small School	**Purpose:** to introduce students to the features of classes in small-group schools, programs for small-group schools, to provide information about the types of classes in small-group schools. **Contents:** natural science subjects are subjects in which the first understanding of the natural laws of the surrounding natural phenomena is formed in the general secondary school. There are several tasks of teaching "Natural Science" subjects in secondary schools. Today, advanced countries develop science education.												
50		PD	HsC	**Industrial and Pedagogical Practice I**	**Purpose:** to prepare students for professional pedagogical activity, familiarization with educational work at school and with advanced pedagogical experience. **Content:** collection of information about the activities of the educational institution and the professional activity of the teacher. Analysis of normative documents defining the content of education according to the updated program. Familiarization with advanced pedagogical experience, the experience of a subject teacher, the	10											

					methodology of teaching computer science and physics (observation and analysis of lessons, study of thematic and lesson plans of the teacher, the plan of elective classes and extracurricular work. Work with an electronic journal and student diaries. The use of digital and other modern technologies during classes. Conducting extracurricular educational work with students.													
51	Fundamentals of Professional Activity	PD	EC	Methods of Measurement of Physical Quantities	**Purpose:** to acquaint with modern principles, methods and means of measuring physical quantities, measuring and other experimental skills. **Content:** terms, definitions, concepts of the physical bases of measurement in the subject; types and methods of measurement; error theory and mathematical treatment of measurement results; methods of processing measurement results; features of calculation and identification of errors in laboratory works; principles of organization of laboratory works; laboratory instruments and methods of measuring known physical quantities are considered.	4				v			v				v	

52				Organization and Planning of Scientific Research in Physics	**Purpose:** to prepare students for the organization of scientific research work in the field of pedagogy, to form students' concept of the general scientific methodology of physical research **Content:** to teach students to use the project method for research work in the process of learning physics, to increase the motivation to study one of the most difficult subjects, and to show teachers the advantages of using the project method for research projects in physics. Scientific works of the department are organized and conducted in educational institutions. In accordance with the work plan, scientific research works planned for one academic year are carried out by professors, teachers and graduate students in accordance with the individual plan of research work. In research and educational institutions, research works on topics are carried out and they are carried out according to work programs.													
53		PD	EC	Technique of School Experiment	**Purpose:** to outline the technique and technique of the physical training experiment, its purpose and objectives. **Content:** The technique of the school experiment in the school physics course is a manifestation of the scientific method of research, characteristic of physical science, therefore the teaching experiment in physics is the source of the students'	7												

					knowledge of physics and the method of studying physical phenomena, the main visual in physics classes.													
54				Processing of Physical Experiment Data	**Purpose:** to teach students to determine the boundaries of the application of the results of the experiment. Based on theoretical knowledge gained in lecture courses, the study of physical phenomena and processes and various physical patterns in practice, obtaining quantitative relationships between physical quantities in practice. **Content:** a physical experiment is a way of knowing nature, which consists in studying natural phenomena in specially prepared conditions. Unlike theoretical physics, which studies a mathematical model of nature, experimental physics is designed to study nature itself.The researcher's leisure time during the experiment is the absence of worthy or worthy interests. Correlate indicators, identify the strength and depth of stability of students' subject orientations.												
55		PD	EC	Methods of Solving Tasks on Physics in Secondary	**Purpose:** to familiarize the students with the methods and methods of solving experimental problems in physics, to form a holistic view of the methods and methods of solving these problems.	4				v			v					v

				School	**Content:** the discipline deals with the types and structure of physical problems; methods of their use in the educational process; analyzed methods of solving problems of various types; methods of solving problems of different sections and specific algorithms for solving problems; examples of conversion of standard tasks into creative.													
56				Methods of Solving Olympiad Tasks in Physics	**Purpose:** to familiarize the students with the methods and methods of solving experimental problems in physics, to form a holistic view of the methods and methods of solving these problems. **Content:** The discipline deals with the classification of problems and their possibility use in the educational process; various technologies for solving problems of high complexity, including the use of mathematical techniques and methods; analyzes the solution of theoretical and experimental problems in physics used at various stages of the national competitions.					v			v					v
57		PD	EC	History of Physics	**Purpose:** to acquaint students with the history of the formation of fundamental ideas, theories and methods of physics, with the evolution of the physical picture of the world. **Contents:** the discipline outlines the main stages in the development of physical science; development considers the main factors that	5				v			v			v		

					determine physics at different stages of growth incentives for certain areas in the evolution of science; the relationship between the development of physics and technology and other sciences is demonstrated; an assessment is made of the role of specific discoveries and research in the development of physics and technology.														
58				Physics and Scientific and Technical Progress	**Purpose:** to acquaint students with the history of the formation of fundamental ideas, theories and methods of physics, with the evolution of the physical picture of the world. **Contents:** the discipline outlines the main stages in the development of physical science; development considers the main factors that determine physics at different stages of growth incentives for certain areas in the evolution of science; the relationship between the development of physics and technology and other sciences is demonstrated; an assessment is made of the role of specific discoveries and research in the development of physics and technology.					v			v			v		
59		PD	HsC	**Teaching and Educational Pedagogical Practice**	**Purpose:** formation of professional pedagogical competencies related to the implementation of the educational process, acquisition of teaching experience by students. **Content:** implementation of educational, extracurricular,	4												v	v

					educational work at school. activity as a subject teacher; organization of independent, individual work of students in the classroom in the conditions of pedagogical practice and diagnostic activities; introduction into the educational process of integrative knowledge in pedagogy, psychology and private methods of teaching the subject; creation of didactic materials using modern and digital technologies; use of criteria-based assessment of educational achievements of students													
60	Theoretical Physics Course	BD	EC	Basic Principles of Analytical Mechanics	**Purpose:** instilling skills and proficiency in the basic methods of mathematical modeling of mechanical motion and methods for solving problems that arise. **Contents:** “Analytical mechanics” - is the science of general laws of mechanical movement and interaction of material bodies. Being one of the most important branches of physics, theoretical mechanics stood out as an independent science, combining a fundamental basis in the form of axiomatics. The basic laws and principles of mechanics are based on many general engineering disciplines such as resistance of materials, structural mechanics, hydraulics, mechanism and machine theory, machine parts and others.	4													
61		BD	EC	Classical Mechanics	**Purpose:** to form a clear idea of the most common concepts, principles and laws of classical													

					mechanics, drawing students' attention to the hierarchy of these laws and the limits of their applicability **Content:** the discipline of classical mechanics is to give future specialists a basic understanding of the balance and movement of various mechanisms encountered in practice. This course discusses the basic concepts of equilibrium and movement of various mechanisms, kinematic and dynamic study of the movement of links of mechanisms encountered in practice.													
62		BD	EC	Electrodynamics	**Purpose:** to study the physics section, which study the basics of the theory of relativistic quantized fields. **Content:** to show that the subject of electrodynamics is a theoretical course based on general laws determined in experiments and then developed as field theory. Show that Electrodynamics is the basis, the introduction of the quantum theory of matter and radiation at the present time. Consideration of the basic principles of the theory of relativity and covariant notation of electrodynamics. Formation of students' modern ideas about space and time.	4												
63		BD	EC	Electromagnetic Energy	**Purpose:** study of the basics of electrodynamics, the General theory of the distribution of electromagnetic waves in various media and the boundaries of their separation, the General properties of the propagation													

					of electromagnetic waves in guiding electrodynamic systems (resonator, waveguide and deceleration systems). **Content:** Electromagnetic waves travel long distances and carry energy and momentum with them. For this reason, light affects our senses. The energy of an electromagnetic wave is characterized by the energy density. The electromagnetic theory of light explained a number of laws of optics. But the properties associated with the quantum properties of matter were explained only on the basis of quantum theory.															
64		PD	EC	Quantum Physics	**Purpose:** to study the discipline is to form the basis of ownership in a student mathematical apparatus and basic methods for solving problems of nonrelativistic quantum mechanic. **Content:** the discipline deals with the fundamental concepts of quantum mechanics: wave properties, uncertainty principles, the Schrödinger equation, the operator method. The main applications of quantum mechanics are analyzed: one-dimensional potentials (harmonic oscillator), centrosymmetric potentials (hydrogen atom), angular momentum and spin; approximation methods are considered: semiclassical approximation, variation principle and excitation theory.	6				v			v					
65		PD	EC	Applied	**Purpose:** The goal of mastering the					v			v					

				Quantum and Statistical Physics	discipline "Applied Quantum and Statistical Physics" is the formation of students' core competencies in the field of quantum mechanics and statistical physics, theoretical and practical knowledge, and skills in this field. **Content:** the discipline deals with the concepts of elementary quantum mechanics and statistical physics: the Schrödinger equation, the tunnel effect, the harmonic oscillator and the hydrogen atom, variational methods, Fermi-Dirac, Bose-Einstein and Boltzmann distribution functions; metals, semiconductors and electron microscopes, scanning tunneling microscope, thermal emitters, atomic force microscope and experiments on these facilities.													
66		PD	EC	Statistical Mechanics	**Purpose:** provide knowledge about the main static patterns of macroscopic systems **Content:** The discipline discusses the principles and methods of statistical mechanics and their application to the physics of condensed matter; analyzes the solution of typical and practical problems, the mathematical form of the basic equations of statistical mechanics and thermodynamics, especially their use in the description of various phenomena.	5												
67		PD	EC	Statistical Physics and Thermodynamics	**Purpose:** to study the physics section, which study the basic principles of thermodynamics. **Content:** The discipline deals with the					v			v					

					principles, methods of formulation and solution of problems, models of thermodynamics and statistical physics; thermodynamic quantities and ratios; ideal and non-ideal gases; methods of physical kinetics; shows examples of calculating the macroscopic characteristics of the system and the solution of typical problems.													
68		PD	HsC	**Industrial and Pedagogical Practice II**	**Purpose:** the inclusion of students in practical pedagogical activity, the formation of students' professional skills and skills of independent conduct of educational work with students. **Content:** acquaintance with the educational institution, with the teaching staff, with school documentation, with the schedule of lessons, with school reporting forms, with the classroom journal, didactic materials and technical equipment of computer science and physics classrooms. The study of pedagogical and psychological characteristics of class students. Conducting and analyzing lessons in computer science and physics, evaluating students' academic achievements using criteria-based assessment, making and using visual aids. Acquisition of practical skills and teaching skills and experience of independent professional activity.	5												

69	Module for acquiring new professional competencies	BD	EC	Subjects of the additional education program	**Purpose:** to develop professional communicative competencies of linguistic, communicative, socio-cultural and further foreign languages for the active use of languages at the everyday and professional level. **Content:** Additional educational program (Minor)(Minor)-a set of disciplines and modules and other types of academic work defined by the student for study in order to form additional competencies.																
70	Module of final certification	PD	HSC	Predegree or Industrial Practice	**Purpose:** to deepen and consolidate the students' theoretical knowledge, to master the creative and thorough experience of practical action, to analyze the phenomena, situations, events of social life, to determine the consequences and connections between them. **Content:** during the practice, the student collects and analyzes the materials, summarizes them for use and interpretation in their work; conducts classes and attends classes of experienced teachers; makes a plan for writing a thesis and coordinates it with his supervisor; writes a report of undergraduate practice.	4															
71				Writing and defence of degree work (project) or preparing and passing a graded exam	**Purpose:** to develop the skills of independent work and to master the methodology of scientific research and experimentation while solving the developed problems and issues. **Content:** selection of research topics, planning of research work.	8															

					Substantiation of the relevance of the chosen topic, goal setting, the definition of the object of study. The formulation of the hypothesis, the definition of the main tasks. Drawing up a schedule of work on the thesis. Writing, design, thesis defense													

5. SUMMARY TABLE REFLECTING THE VOLUME ASSIMILATED CREDITS OF EDUCATION PROGRAM MODULES

Course of Study	Semester	The number of mastered modules	The number of studied disciplines			Number of KZ credits					Total hours	Total KZ credits	The number of	
			OC	HsC	EC	Theoretical training	Physical training	Educational practice	Industrial practice	Final examination			exam	Differentiated test
1	1	5	5		2	28	2				900	30	6	1
	2	3	4		2	27	2	1			900	30	5	2
2	3	5	2	4	2	27	2		1		900	30	6	3
	4	5	1	3	3	26	2		2		900	30	6	2
3	5	5	1	2	3	28			2		900	30	5	1
	6	3			3	26			4		900	30	3	1
4	7	4		1	5	33			10		1290	43	5	2
	8	1							9	8	510	17		2
Total		13	9	10	20	195	8	1	28	8	7200	240	36	14

6. STRATEGY AND METHODS OF TRAINING, CONTROL AND EVALUATION.

Learning Strategies	Student-centered education: the learner is the center of learning/learning and an active participant in the learning and decision-making process. **Practice-oriented education:** focus on the development of practical skills

Teaching methods	Conducting lectures, seminars, various practices:
	• using innovative technologies:
	  • problem-based learning;
	  • topical research;
	  • work in a creative group and group;
	  • discussions and dialogues, intellectual games, Olympiads, quizzes;
	  • reflection, projects, benchmarking methods;
	  • Bloom's Taxonomy;
	  • presentations;
	• with rational and creative use of information sources:
	  • multimedia training programs;
	  • electronic textbooks;
	  • digital resources.
	
	Organization of independent work of students, individual counseling.

Monitoring and evaluation of the achievement of learning outcomes	**Current control** is carried out to control knowledge in classroom and extracurricular activities for each topic of the discipline (according to the syllabus). **Evaluation Forms:** • survey in the classroom; • testing on the academic discipline; • test papers; • protection of independent work; • discussions; • trainings; • colloquia; • essay writing, etc. **Intermediate control** is carried out only in one academic subject at least twice in one academic period. **Intermediate certification** is carried out in accordance with the academic calendar, working curriculum. Conduct forms: • exams in the form of testing; • oral exams; • written exams; • combined exams; • protection of projects;

	• acceptance of reports on practice. **Final state certification**

7. EDUCATIONAL AND RESOURCE SUPPORT OF THE EP

Information Resource Center	The information and educational center includes 6 subscriptions, 16 reading rooms, 2 electronic resource centers (ERC). The basis of the ACS network infrastructure is 180 computers connected to the Internet, 110 workstations, 6 interactive whiteboards, 2 video doubles, 1 video conferencing system, 3 A-4 format scanners, a stand-alone server with MS Windows software Akis "IRBIS-64" (6-module basic kit). Library Fund 7 days a week 24 hours online http://lib.ukgu.kz in an electronic catalog available to users on the site. Thematic databases have been created: "Almamater", "Works of scholars-readers", "electronic archive". Online 24/7 http://articles.ukgu.kz/ru/pps is available from any device via the link. Catalogs are processed electronically. The EC consists of 9 databases: "books", "articles", "periodicals", "works of the teaching staff", "rare books", "electronic fund", "reading in the press", "readers" and " YUKO". For its users, ACS offers 3 options for access to electronic information resources: from the “electronic catalog” terminals in the hall of catalogs and departments of ACS; university information network for faculties and departments; remote access to the electronic information resources of the library http://lib.ukgu.kz/web-sites through. Access to international and republican resources: to electronic versions of open access scientific journals "SpringerLink", "Polpred", "Web of Science", "EBSCO", "Epigraph", "Zan", "Republican Interuniversity Electronic Library RMEB", "literature ", digital library "Akpigrgess", "Smart-kitar", "Kitar.kz" and others. For students with special needs and disabilities, the library website is adapted to the work of visually impaired users.
Material technical base	For the preparation of bachelors in this direction, there is an appropriate material and technical base of the specialty, that is, classrooms, laboratories, computer classes that meet the requirements of the state educational standard. The department "Physics" in the building №7 have 9 classrooms with a total area of 328.3 m^2 (215, 219, 222, 224, 226, 228, 230, 232, 215) applies. Cabinet 219 (74.4 m^2) is considered an auditorium where various classes are held. Cabinet 228 (51.8 m^2) is a teaching office. Utility rooms is a 215 with a total area of 35 m^2. There are 13 computers in 222 (35.7 m^2) computer labs. Cabinet 226 (28.4 m^2) - laboratory of mechanics and molecular physics. Cabinet 224 (26.1 m^2) laboratory of electricity and magnetism. Cabinet 230 (34.7 m2) MTT and astronomy laboratory. Cabinet 232 (42.2 m^2) - optics, atomic and nuclear physics (an interactive whiteboard is installed here). The laboratories of the Center "Sapa" and "IRLIP" have a specialized scientific and technical experimental base, where students of EP 6B05310, while studying the discipline, study modern experimental facilities: the physical foundations of physical and chemical analysis, and also undergo industrial practice.

APPROVAL SHEET

by Education Program «6B01520-Physics»

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