Ф.7.02-09

MINISTRY OF SCIENCE AND HIGHER EDUCATION OF KAZAKHSTAN REPUBLIC

SOUTH - KAZAKHSTAN UNIVERSITY named after M. AUEZOV

"APPROVE"

Chairman of the Board "Rector"

D.h.sc., Academician Koznamzharova D.P.

AUEZOV UNIVERSITY 1943

"__" _____ 202__

EDUCATIONAL PROGRAM

"6B01521 Mathematics-Physics"

Registration number	6B01500065
Code and classification of the field of education	6B01- Pedagogical Science
Code and classification of areas of study	"6B015-Training of Teachers in Natural Science Subjects"
Group of educational programs (EP)	B009 Training of mathematics teachers
EP type	active
ISCE level	6
NQF level	6
IQF level	6
Language learning	Kazakh, Russian, English
The complexity of EP	240 credits
Distinctive features of EP	Not
Partner University (JEP)	-
University partner (DDEP)	-

Shymkent, 2023

Developers:

Full Name	Position	Signature
Adyrbekova G.M.	Head of the Center for Management of Educational Programs, c.ch.sc, associated professor	
Saidakhmetov P. A.	c.ph.-m.sc., associated professor	
Tursynbaev A. Z.	c. p.sc., associated professor	
Baubekova G.M.	master of physics	
Sericbaeva G.S.	master of physics	
Ospanova A.Zh.	student of group EP-20-14k2	
Bekbaeva S.A.	student of group EP-20-14k1	
Almahankyzy Raushan	Director of the IT school-Lyceum № 7 named after K. Spataev	МП
Ayubekova Tolkyn Polatbekovna	Director of school-lyceum No. 77 named after A. Askarov	
Sarzhanova Zhanar Yerzhanovna	Director of school-lyceum No. 15 named after D.I. Mendeleev	
Abildaeva Gulnaz Sailauovna	Director of IT Lyceum No. 9 named after U. Zholdasbekova	
Karabota Bauyrzhan Shamshidinovich	Director of the school No. 39 named after M. Zhumabayev	

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

protocol No. 4а dated "10" 02 2023.

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

CONTENT

1. CONCEPT OF THE PROGRAM

University Mission	Generation of new competencies, training of a leader who translates research and entrepreneurial thinking and culture
University Values	• Openness–open to change, innovation and cooperation. • Creativity – generates ideas, develops them and turns them into values. • Academic freedom – free to choose, develop and act. • Partnership – creates trust and support in a relationship where everyone wins. • 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. • Information and digital literacy and mobility in rapidly changing conditions. • 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 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. • 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. The uniqueness of OP 6B01521-Mathematics-Physics 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 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 OP 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 kind of intolerance and discrimination: • * Rules of academic integrity (Minutes of the Academic Council No. 3 dated 30.10.2018); • Anti-Corruption Standard (Order No. 373 n/a dated 27.12.2019). • Code of Ethics (Minutes of the Academic Council No. 8 dated 31.01.2020).
Normative – legal framework for the	1. The Law of the Republic of Kazakhstan "On Education" (with

development of the OP	amendments and additions as of 01.04.2023) 2. Standard rules for the activities of educational organizations implementing educational programs of higher and (or) postgraduate education, approved by the Order of the Ministry of Education of the Republic of Kazakhstan dated October 30, 2018 No. 595 with amendments and additions dated 12/29/2021 No. 614; 3. State mandatory standards of higher and postgraduate education, approved by the Order of the Ministry of Education and Science of the Republic of Kazakhstan dated July 20, 2022 No. 2; 4. Order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated January 19, 2023 No. 21 "On Amendments to the Order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022 No. 2. Registered with the Ministry of Justice of the Republic of Kazakhstan on January 20, 2023 No. 31742. 5. Rules for organizing the educational process on credit technology training approved by the Order of the Ministry of Education and Science of the Republic of Kazakhstan dated April 20, 2011 No. 152 (with amendments and additions as of 05/06/2021) 6. 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 dated December 30, 2020 No. 553. 7. Guidelines for the use of ECTS. 8. 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 OP	• Internal quality assurance system • Involvement of stakeholders in the development of the OP and its evaluation • Systematic monitoring • Updating the content (updating)
Requirements for applicants	Established according to the Standard Rules of admission to 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	For students with OOP and LSI, tactile PVC tiles, specially equipped

implementation of OP for persons with disabilities and OOP	toilets, a mnemonic circuit, rods in shower rooms are installed in academic buildings and student dormitories. Special parking spaces have been created. A crawler lift is installed. There are desks for MGN, signs indicating the direction of movement, ramps. The academic buildings (main building, No. 8 building) are equipped with 2 classrooms with six workstations adapted for users with disorders of the musculoskeletal system (ODE). For visually impaired users, there is a SARA™ CE machine (2 pcs.) for scanning and reading books. The library's website is adapted for the visually impaired. There is a special NVDA audio program with the service. OFIC web site http://lib.ukgu.kz / in 24/7 operation mode. An individual differentiated approach is provided for all types of classes and in the organization of the educational process.

1. 1. OP PASSPORT

Purpose of the OP	Training of teachers capable of using mathematical apparatus to explain and operate physical phenomena and processes, to form skills of intellectual, moral development of students' personality and to demonstrate professional values
OP tasks	– satisfaction of 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 fields of professional activity, as well as advanced training, training in additional education programs and continuing education in the master's degree; – acquisition of competence and experience of creative activity in the field of physics and mathematics and methods of their teaching; – meeting the needs of society for qualified specialists in the field of education and teaching of physics and mathematics, able to integrate academic values with entrepreneurial ideas; – providing conditions for acquiring a high general intellectual level of development, mastering competent and developed speech, culture of thinking and skills of scientific organization of work 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 to ensure the possibility of their employment in the specialty
Harmonization of OP	• 6th level of the National Qualifications Framework of the Republic of Kazakhstan; • Dublin descriptors of the 6th level of qualification; • 1 cycle of the Qualification 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 (The European Qualification Framework for Life long Learning).
Connection of the OP 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
Name of the degree awarded	After successful completion of this OP, the graduate is awarded the degree of "Bachelor of Pedagogical Sciences in the educational program 6B01521 Mathematics-Physics"
List of qualifications and positions	A graduate of the educational program 6B01521 Mathematics-Physics is awarded a Bachelor of Pedagogical Sciences degree. Bachelors in OP 6B01521 Mathematics-Physics can be accepted for the following positions in the fields of education: teacher without a category, trainee teacher, teacher, 2nd category teacher, 1st category teacher, moderator teacher, higher category teacher, expert teacher, middle-level teacher of educational directions, methodologist, instructor, tutor, teacher, team leader, deputy head of the institution, head of the structural department, adviser. Qualification directory of managers, specialists and other employees, approved by the Order of the Minister of Labor and Social Protection of the Republic of Kazakhstan dated May 21, 2012 No. 201.
Field of professional activity	The sphere of professional activity is the field of education
Objects of	The objects of professional activity of graduates are organizations and

professional activity	educational institutions of various forms of ownership, scientific and research centers.
Subject of professional activity	The subjects of the bachelor's professional activity in OP 6B01521 – Mathematics - Physics - the educational process in the unity of its value-target orientations, content, methods, forms and results; - research, innovation, information and analytical activities in the field of mathematics, physics and teaching methods, pedagogy and psychology.
Types of professional activity	Bachelor in OP 6B01521 –Mathematics-Physics can perform the following types of professional activities: – educational; – pedagogical; – educational and educational; – educational and technological; – organizational and methodological. – scientific 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 computing literacy, the ability to generalize, analyze and perceive information, set goals and choose ways to achieve it. LO4. Make lesson plans, conducting them taking into account the characteristics and needs of students, and 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. LO7. Explain the laws and theories of physics, applying them to solve problems in professional activity and in everyday life. LO8. Solve practical problems using methods of various branches of higher mathematics. LO9. Apply techniques and methods of mathematics research, and solution algorithms in the course of solving specific practical problems. LO10. Solve practical problems and problems of physics using mathematical apparatus and methods of statistical data analysis. LO11. To carry out research work on the methodology of teaching physics and mathematics, based on current trends in their development and involving students in this activity. LO12. The ability to work in a team, plan and implement professional continuing education in formal, informal, and informational forms.

3 COMPETENCIES OF AN OP GRADUATE

GENERAL COMPETENCIES (SOFT SKILLS). Behavioral skills and personal qualities	
OK 1. Competence in managing your literacy	OK1.1. The ability to self-study, self-develop and constantly update their knowledge within the chosen trajectory and in an interdisciplinary environment. OK 1.2. The ability to express thoughts, feelings, facts and opinions in the professional sphere. OK 1.3. The ability to mobility in the modern world and critical thinking.
OK 2. Language competence	OK2.1. The ability to build communication programs in the state, Russian and foreign languages. OK 2.2. The ability to interpersonal social and professional communication in the context of intercultural communication.
OK 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;
OK 4. Digital competence, technological literacy	OK4.1. The ability to confidently and critically use modern information and digital technologies for work, leisure and communication; 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;

OK 5. Personal, social and educational competence	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; 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; 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; OK 5.4. The ability to work in a team, correctly defend their point of view, offer new solutions; demonstrate tolerance towards other individuals.
OK 6. Entrepreneurial competence	OK 6.1. The ability to be creative and demonstrate entrepreneurial skills. OK 6.2. The ability to manage projects to achieve professional goals. OK 6.3. Ability to work with consumer requests
OK 7. Cultural awareness and ability to express oneself	OK 7.1. The ability to know and understand the traditions and culture of the peoples of Kazakhstan. 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 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 – The ability to design, organize and analyze pedagogical activities, ensuring consistency of presentation of material and interdisciplinary connections of physics with computer science and with other disciplines.

3.1 Matrix of correlation of the results of training in the OP as a whole with the competencies being formed

	RO1	RO2	RO3	RO4	RO5	RO6	RO7	RO8	RO9	RO10	RO11	RO12
OK1												
OK2												
OK3												
OK4												
OK5												
OK6												
OK7												
PK1												
PK2												
PK3												
PK4												
PK5												
PK6												
PK7												

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

	Name of the module	cycle	component	Name of the discipline	Brief description of the discipline	Number of credits	Generated learning outcomes (codes)											
							RO1	RO2	RO3	RO4	RO5	RO6	RO7	RO8	RO9	PO10	PO11	PO12
1	Fundamentals of the Public Sciences	OOD	OK	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. **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	v	v										v
2		OOD	OK	Philosophy	**Purpose**: to form a holistic view of philosophy as a special form of	5	v	v										v

					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. **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														
3	Socio-Political knowledges	OOD	OK	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	4	v	v										v

					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, 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		OOD	OK	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	4	v	v				v						v

					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													
5	Socio-ethnic development	OOD	VK	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. Contents: 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	KH	Abai Studies	**Purpose**: preservation of the "national code" in the project "Kazakhtanu" based on the creativity of A.Kunanbayev Contents: historical overview of the	3	v	v											

					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 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		DB	KH	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. **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 the defenseless", "pictures of kyr", "read citizen", "Kokserek",the play Enlik-Kebek and the story "Kili Zaman", "The Story of Karash-Karash", the		v	v										

					monograph" Abay Kunanbayev", the novel - epic" the way of Abay".													
8		DB	KH	Actual Problems and Modernization 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 social 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 openness of consciousness. Alphabet reform: experience and priorities. The motherland 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.		v	v										

9		BD	KH	Service to Society	**Purpose**: formation of socially significant skills and competencies among students based on the assimilation of academic programs, carrying out socially useful activities related to the disciplines studied at the university. **Content**. The concept and meaning of Service learning, the history of the formation and development of the concept of Service Learning. The key components of Service Learning, socially useful activities in children and youth, the organization of the volunteer movement in the world and Kazakhstan practice, the profile orientation of Service Learning. International practice of learning through socially useful activities. General principles and methodology for the development of social projects. Methods of analysis of implemented social projects.		v	v										
10		DB	KH	Foundations of Anticorrupshion Culture	**Purpose**: formation of an anti-corruption worldview, strong moral foundations of personality, civic position, stable 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		v	v										

					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 manifestations of corruption												
11	Communication and physical education	OOD	OK	Kazakh (Russian) language	**Purpose**: formation of communicative competence using the Kazakh (Russian) language in the socio-cultural, professional 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 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	10	v		v									

					development of critical thinking.													
12		OOD	OK	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 **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 development of critical thinking.	10	v		v									
13		OOD	OK	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	8	v		v			v						

					activity; to the persistent transfer of physical exertion, 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		DB	VK	Professional Kazakh (Russian) language.	**Purpose**: to provide professionally oriented language training for 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	3	v		v									

					work on the analysis and production of scientific texts in the specialty. Production of scientific and professional texts. Fundamentals of business communication and documentation in the framework of future professional activity.													
15		DB	VK	Professionally-oriented foreign language	**Purpose:** development of communicative scientific speech and writing skills using an expanded vocabulary of physical science terms and professionally oriented material. **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 activity; the possibilities of a foreign language as a source of expanding their linguistic, cognitive and pragmatic competencies are revealed.	3	v		v									
16		OOD	OK	Information and communication technologies	**Purpose**: formation of the ability to critically evaluate and analyze processes, methods of searching, storing and processing information,	5	v		v						v			

					ways of collecting and transmitting information through digital technologies. **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 control.														
17	Basics of Pedagogical Skills	DB	VK	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. 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	5		v							v	v		v

					of immunity of students to the negative influences of cyberspace													
18		DB	VK	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 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.	4						v					v	v
19		PD	VK	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 of qualification testing in the field of mathematics and physics are considered; the application of the laws of physics to solve practical problems is shown, examples of drawing up and solving problems are	4				v				v		v		

					given. The ways of adaptation of students to solving problems arising in the daily life of the subject in mathematics, physics, by justifying practical actions are considered.													
20		DB	VK	Pedagogical practice	**Purpose**: development of general cultural and improvement of professional competencies of students. **Content**: familiarization of students with the school, the classroom and the organization of educational work with students; collection of information about the activities of the educational institution, the professional activity of the teacher; 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 work; analysis of the educational work of the classroom supervisor; attendance of classes and events held by the class teacher; preparation of a report	1											v	v
21	Fundamentals of Psycho-Pedagogical Sciences	DB	VK	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.	4						v						v

					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.													
22		DB	VK	Physiology of the development of schoolchildren	**Purpose**: to teach future teachers to 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	4						v						v

					development and their application in solving problems, formulation, execution, analysis and formulation of conclusions when performing practical work in a group and individually.													
23		DB	VK	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 motivational and methodological readiness for the implementation of educational activities.	4								v	v			v
24		DB	VK	Psychological and pedagogical practice	**Purpose**: introducing a 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 features	2											v	v

					of the collective of students; 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; to evaluate the results the educational process and to carry out its reflection													
25	Methodological foundations of teaching	DB	KV	Introduction to the specialty	**Purpose**: to form students' understanding of mathematics and physics and their research methods, contributing to the formation of the foundations of the professional culture of the future teacher. **Content**: the subject, tasks and patterns of development of mathematics and physics, the connection of mathematics and physics with production and with the development of other sciences; analysis and evaluation of modern problems of mathematics and physics; basic methods of cognition at the empirical and theoretical level; disclosure of the essence of pedagogical activity, its social role and	4								v			v	

					educational functions; definition of professionally significant qualities of a teacher's personality; opportunities professional and personal growth of the teacher and his creative self-realization.													
26		DB	KV	Fundamentals of Academic Writing	Purpose: to master these rules for the design and creation of academic content and documents used in professional activities. Content: the ability to compile scientific reports, articles and theses, correspondence and contracts, as well as research papers and essays, search for information; work with sources, make references to the works of other authors, know the values and norms of academic ethics, types and types of plagiarism, methods of citation. The features and examples from practice are studied. They gain experience in reviewing printed publications and electronic resources, as well as protecting their own manuscript.		v	v	v									
27		PD	VK	Methods of teaching and evaluation in physics	**Purpose**: to familiarize students with the basics of the professional activity of a physics teacher **Content**: the tasks and modern concept of teaching physics at school are considered; forms of organization of training sessions; methods and techniques of teaching physics; types of control of students' knowledge and	6					v		v		v	v		

					skills; structure and content of assessment; principles, methods, tasks and means of assessing students' knowledge; issues of planning and organization of the processes of formative and summative assessment of students' educational achievements.													
28		PD	VK	Educational and methodical (pedagogical)practice	**Purpose**: establishing 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 classroom and the organization of educational work with students; attendance of lessons and educational hours of teachers in a fixed classroom; 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 didactic materials for the classes using modern digital, smart and stem technologies, learning strategies; compilation of psychological and pedagogical characteristics of the student's personality; compilation of a report reflecting the results of educational activities.	2								v			v	
29	Fundam	PD	KV	Teaching and	**Purpose**: to equip all students with	5					v		v		v	v		

	entals of professional activity			Assessment in Mathematics	systematic knowledge of the scientific foundations of mathematics and the skills necessary for their full mastery. As a result of such knowledge, the psyche of students develops. **Content**: knowledge and understanding of the objectives of the subject of the methodology of teaching mathematics at school, its content. Knowledge and understanding of the principles and scientific methods of teaching mathematics, forms and means, mathematical concepts, proposals and methods of their study. The ability to state theorems, methods of proving theorems. Knowledge of psychological and pedagogical foundations in teaching mathematics, formation of cognitive interest in mathematics													
30		PD	KV	Methods of teaching natural sciences in a small school	**Purpose**: familiarization of students with the methodological foundations of working with natural science-oriented material, forming an integrated approach to teaching students natural science disciplines at school. **Content**: the basics of the content, material equipment, methods, forms of work with natural science-oriented material in high school and the specifics of its selection and construction are outlined; the essence					v		v	v	v	v		

					of the integrated approach in teaching natural science disciplines is revealed; examples of developed integrated classes in natural science disciplines using the project, research method of teaching, as well as digital technologies of homemade equipment are given.													
31		PD	KV	Technique of the school experiment	**Purpose**: to outline the methodology and technique of the educational physical experiment, its goals and objectives. **Content**: the discipline analyzes the experimental method of teaching physics; the structure and objectives of scientific and educational physical experiment; didactic functions and requirements for an educational physical experiment and its features, requirements for the technique and technology of its conduct; topics of laboratory classes; principles of completing physics classrooms with educational equipment; describes the principle of operation of devices necessary for the experiment.	5		v		v					v			
32		PD	KV	Processing of physical experiment data	**Purpose**: to teach students to determine the boundaries of experimental results. **Content**: the course introduces the packages of symbolic and numerical computing applications, and tabular processors; methods of processing			v		v					v			

					large information arrays and graphical representation of results in solving various physical, statistical and technical problems, mathematical modeling. Unlike theoretical physics, which studies a mathematical model of nature, experimental physics is designed to study nature itself. Correlate indicators, identify the strength and depth of stability of students' subject orientations													
33		PD	VK	Educational pedagogical practice	**Purpose**: the formation of professional pedagogical competencies related to the implementation of the educational process, the acquisition of pedagogical experience by students. **Content**: implementation of educational, extracurricular, 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	4										v	v	v
34	Fundam entals of	BD	KV	Analytical geometry	**Purpose:** to introduce the basic concepts and methods of modern	5		v						v	v			

	the mathematics course				analytic geometry. **Contents:** vector algebra is studied; considers the transformation of Cartesian rectangular coordinates, the main ways of describing geometric objects by algebraic methods; linear images are described, as well as the theory of second-order images. Examples of the use of the studied concepts in physics and technology are given. General equation of a straight line on a plane, equation of a straight line in vector form. The canonical and parametric equations of a straight line, the normal equation of a straight line are considered. The equation of a straight line in segments, the equation of a straight line with a slope.													
35		BD	KV	Determinant theory	**Purpose**: to study the basic definitions and properties of determinants, methods of calculating determinants, axiomatic construction, alternative methods of calculation. **Content**: solving SLAE using determinants, analysis of some special properties and types of determinants. The application of determinants in other natural sciences is considered. Determinants of the second and third order are studied. The main properties of all determinants of the 3rd and higher order, their properties and solutions of these determinants.			v					v	v			

					Systems of linear algebraic equations are studied. Methods for calculating n-th order determinants using the properties of other determinants are considered.													
36		BD	KV	Differential calculus of functions of one variable	**Purpose**: to study the basic methods of studying variables, the theory of series, finding the derivative of a function. The ability to find the derivative of a function of one variable, from a complex function, from the product of two functions, from the ratio of two functions. **Content**: the discipline deals with problems leading to differential equations, differential equations of the first order, integrable in quadratures; sets out equations that are not resolved with respect to the derivative, higher-order differential equations that allow lowering the order; linear homogeneous and inhomogeneous differential equations of higher orders. The main methods of integration of systems of differential equations, some methods of solving integral equations are given.	6		v						v			v	
37		BD	KV	The theory of infinitesimals	**Purpose**: to familiarize students with the fundamental methods of studying variables through infinitesimal analysis, which is based on the theory of differential and integral calculus. **Content**: knowledge and			v						v			v	

					understanding of infinitesimal sequences, concepts of their upper and lower limits. The study of fundamental methods for the study of variables, the analysis of infinitesimals. Knowledge and understanding of the theory of differential and integral calculus. The ability to prove theorems and derive formulas.													
38		BD	KV	Integral calculus of functions of one variable	**Purpose:** to present the concept of calculus with one variable and its application in solving applied problems. **Contents:** the theory of function, rules of differentiation, definite and indefinite integrals are presented. Integration methods are considered. Examples of differentiation for solving applied problems are given, examples of calculating the integral for calculating the arc length, the volume of rotation and the surface area of rotation. Definition of the primitive function. The theorem on the infinite set of primordial for a given function. The concept of an indefinite integral. The solution of an indefinite integral according to the standard formula.	4		v						v			v	
39		BD	KV	Application of the one-dimensional integral	**Purpose**: to familiarize future teachers with the main parts of mathematical analysis, providing theoretical knowledge of the mathematics course, ensuring quality, depth of knowledge.			v						v			v	

					Content: Knowledge and understanding of Darboux sums and their properties, Newton-Leibniz formulas. The ability to solve improper integrals with infinite limits and integrals from unlimited functions. Knowledge of the concept of absolutely convergent improper integrals. The ability to prove the basic theorems of integral calculus. Ability to solve some problems of geometry and physics.													
40		BD	KV	Differential calculus of a function of many variables	**Purpose**: to present the concept of multidimensional calculus and its application in solving applied problems. **Content**: the concept of a function of many variables is considered, the basic theorems of calculus, finding the differential of functions, methods of calculus of functions of several variables are presented. Examples of solving problems of a combined and complicated nature (functions given implicitly) are given; the application of calculus in natural sciences and engineering is studied.	5		v						v			v	
41		BD	KV	Series theory	**Purpose**: to familiarize students with numerical series, differential and integral calculus of functions of many variables. **Content**: knowledge of the concepts of numerical, alternating, functional,			v			v			v			v	

					power series and their properties. Knowledge of the signs of convergence of series. The ability to prove the basic theorems of the differential calculus of the function of many variables. Knowledge of the method of slow integration and differentiation of series. The ability to solve problems for finding the sum of series.													
42	Основы предметной подготовки	BD	KV	Fundamentals of mechanics	**Purpose**: to teach students to describe and predict the motion of bodies based on the laws and methods of mechanics **Content**: the concepts, laws and methods of classical mechanics, the construction of physical models are considered; planetary motions based on kinematic and dynamic methods of describing mechanical systems are studied; the application of the principles of mechanics and conservation laws for describing and predicting the movements of bodies is shown; examples of solving practical problems of physics are given; the finding of physical quantities using experimental installations and digital technologies is discussed.	6				v	v		v					
43		BD	KV	Experimental mechanics	**Purpose**: to form students' skills of experimental description of mechanical phenomena based on the laws and methods of classical mechanics					v	v		v					

					Content: the discipline has a practical orientation and implements an approach to mechanics through demonstrations, experiments and computer experiments conducted in the classroom and at home. It discusses the methodology of the experiment and the processing of its results; describes the physical properties of mechanical systems using experimental work and solutions to practical problems of physics.													
44		BD	KV	Molecular physics	**Purpose**: to form students' ideas about the laws of physical phenomena caused by the atomic and molecular structure of matter. **Content**: the basic concepts and laws of molecular phenomena, physical properties of systems of atoms and molecules are considered; methods of describing macroscopic bodies and educational experimental work are described; the principles of operation and the device of modern experimental equipment are described. The solution of problems of molecular physics, the application of the laws of thermodynamics in engineering and experimental results in the field of molecular physics are presented.	4				v	v		v					
45		BD	KV	Thermodynamics and kinetics	**Purpose**: to form students' ideas about the methods of thermodynamics and kinetics for the analysis of processes in					v	v				v			

					substances with atomic and molecular structure. **Content**: the discipline considers the equilibrium properties of macroscopic systems. The principles of thermodynamics and their consequences and 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 in solutions are solved, the rates of simple chemical reactions are determined.													
46		BD	KV	Electricity and magnetism	**Purpose**: to form students' ideas about the laws of electromagnetism, based on their practical application. **Contents**: the basic concepts of electromagnetism: charge, electric and magnetic fields, their intensity and potential, current, electromagnetic vibrations and waves; the basic laws and theorems of electromagnetism, classification of substances by magnetic susceptibility are described; the assessment of the main parameters in the interaction of substances with electromagnetic fields and the application of the laws of electromagnetism for solving practical problems is given.	6				v	v				v			
47		BD	KV	Electromagnetism in practice	**Purpose**: to form students' skills of practical application of the laws of					v	v				v			

					electromagnetism. **Contents**: the discipline explains the practical applications of electromagnetic phenomena: wired, wireless and optical communication, circuits of electromagnetic devices, microwave communication, radar, antennas, generators, motors and sensors, optical and acoustic devices, production and transmission of electricity. The basics of the discipline are presented: electromagnetic fields, solutions of Maxwell's equations, electromagnetic radiation, controlled waves, resonance, acoustic analogues, electromagnetic forces and energy.													
48		BD	KV	Optics	**Purpose**: to form students' ideas about the laws of optical radiation and their application in practice **Content**: the discipline examines the physical foundations of phenomena related to the interaction of light with matter; the main experimental results in the field of optical phenomena; the basic laws of geometric and wave optics, analyzes methods for 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.	4				v	v		v					
49		BD	KV	Applied Optics	**Purpose**: to form students' skills of practical application of the laws of					v	v		v					

					optics. **Content**: fundamentals of modern optics, the law of light propagation and image formation, properties of optical radiation, its interaction with matter; characteristics of optical systems, their element base; basic principles of construction and operation of the simplest optical systems are shown; examples of determining the characteristics of an optical system and evaluating the influence of an optical system element on image formation are given.													
50		BD	KV	Physics of the atom and atomic nucleus	**Purpose**: mastering students' basic knowledge of nuclear physics and mastering its methods for using them in professional activities **Content**: basic concepts of atomic, nuclear physics and elementary particle physics; orders of physical quantities used; basic experiments and basic experimental results, experimental methods of atomic and nuclear physics are analyzed; the use of the laws of atomic and nuclear physics in solving practical problems and conducting laboratory work is explained.	5				v	v		v					
51		DB	KV	Introduction to Applied Nuclear Physics	**Purpose**: to show students the application of the laws and methods of nuclear physics research in practice **Content**: the discipline examines the					v	v		v					

					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 possibilities of applying these phenomena and processes; sections concerning the structure of the nucleus, the laws of radioactive decay and nuclear reactions, the basic properties of elementary particles and fundamental interactions													
52		DB	VK	Educational practice	**Purpose**: obtaining primary professional skills and abilities **Content**: During the internship, the student gets acquainted with the organization of the work of the department; the content and organization of pedagogical work at the department, with normative documentation; educational program, syllabus on the subject; analyzes the educational and methodological activities of the teacher of the department; visits classrooms and laboratories and gets acquainted with their equipment and design; makes a report on practice.	1											v	v
53	Fundamentals of fundamental mathema	DB	KV	Differential equations	**Purpose**: to form students' knowledge about the theory of differential equations and basic techniques for solving practical problems. **Contents**: the basic concepts of the	4					v			v	v		v	

	tics				discipline, methods of solving differential equations are considered; methods of constructing mathematical models of various physical processes, solving a one-dimensional wave equation by the method of characteristics, the general solution of the Cauchy problem using the Dalembert formula, solving problems of mathematical physics by the method of separation of variables are described; examples of the use of differential equations in solving various practical problems are given.													
54		DB	KV	Theory of operator transformations	**Purpose**: systematic explanation of the basic concepts of the course of ordinary differential equations and the main methods of their solution, application in physics, engineering. **Contents**: knowledge and understanding of the definitions and properties of the Laplace transform, expansion of the class of originals, restoration of the original from the image, conversion formulas and decomposition theorems. The ability to apply the Laplace transform to solving linear differential equations and their systems.						v			v	v		v	
55		PD	KV	Probability theory and mathematical statistics	**Purpose**: to study the patterns of random events and random variables, properties and basic operations on them; elements of statistics.	6					v			v	v		v	

					Contents: study of combinatorics, probability, random variable and its characteristics, conditional probability, the law of large numbers, elements of mathematical statistics. Analysis of methods for solving problems on finding probability, methods of collecting, processing and analyzing statistical data.													
56		PD	KV	Graph theory	**Purpose**: to teach the basic methods of mathematical description of the structure of various objects. The study of the basic terms of graph theory (graphs, graph types, paths and connectivity, trees). **Content**: the application of graph theory in relation to mathematics is considered. The current state of graph theory, some of their problems and open problems are presented. Analysis of the structural properties of the specified objects. Mastering the basic algorithmic constructions available at the moment.						v			v	v		v	
57	Modern problems of education	PD	KV	Computer methods of physics	**Purpose**: formation of practical programming skills of the basic mathematical algorithms used in solving physical problems and processing experimental data, methods of their effective implementation on a computer, estimation of the error of the results of the performed tasks used in modeling physical phenomena.	5			v						v			

					Content: the discipline considers a general idea of the MATLAB programming environment; formatting two- and three-dimensional graphs; working with graphs and building special graphs of the MathCAD and MATLAB systems; animations and analysis of physical phenomena in the MATLAB system; solving physics problems in the Pascal language, in the MathCAD and MATLAB programming environment.													
58		PD	KV	Modeling of physical processes	**Purpose**: formation of practical programming skills of basic mathematical algorithms used in solving physical problems and processing experimental data. **Content**: the discipline describes methods for constructing mathematical models of physical phenomena, their qualitative analysis, development of algorithms for solving equations that make up the essence of the phenomenon model; analyzes the basics of computer modeling; considers visualization and work with packages for modeling molecular dynamics; principles of computer experiment and analysis of its results; solving problems using software packages.				v						v			
59		PD	KV	History and methodology of	**Purpose**: to acquaint students with the history of the formation of	4		v					v					

				mathematics	fundamental ideas, theories and methods of mathematics, with the evolution of the mathematical picture of the world. **Content**: knowledge and understanding of the emergence of the first mathematical concepts and concepts, the first mathematical theory and methods. The study of mathematics of late antiquity, mathematics of Central Asia, the Near and Middle East, medieval Europe. Knowledge and understanding of the peculiarities of the emergence of analytical geometry, the creation of differential and integral calculus. Study of the development of the theory of series, differential equations, probability theory, etc.														
60		PD	KV	Organization and planning of research work in mathematics and physics	**Purpose**: familiarization of students with the organization and planning of research work, methodology and methods of scientific research **Content**: the stages of scientific research, methodology by methodology and methods of theoretical and experimental research are considered; methods of experiment planning, methods of setting up an experiment and processing its results, analysis of theoretical and experimental research and formulation of conclusions and proposals,					v						v	

					innovative activity, implementation and effectiveness of scientific research, rules for registration and protection of research results are described. Examples of modeling physical processes and computational experiments, scientific projects in mathematics and physics of students using physical and mathematical methods and algorithms, and digital technologies are given.													
61		PD	VK	Industrial pedagogical practice I	**Purpose**: preparation of students for professional pedagogical activity, familiarization with educational work at school and with advanced pedagogical experience. **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.	10										v	v	v

					Conducting extracurricular educational work with students.													
62	Practical course in physics and mathematics	PD	KV	Methods of solving physics problems in secondary school	**Purpose**: to familiarize students with methods and methods of solving problems in physics **Content**: the discipline examines the types and structure of physical problems; methods of their use in the educational process; analyzes the methods of solving problems of various types, general and particular algorithms for solving standard problems; methods for solving problems of various sections of the school physics course and algorithms for solving them; examples of converting standard problems into creative ones are given.	7		v	v	v						v		
63		PD	KV	Methods of solving Olympiad problems in physics	**Purpose**: to familiarize students with methods and methods of solving complex problems in physics. **Content**: the discipline considers the classification of problems and the possibility of their use in the educational process; various technologies for solving problems of increased complexity, including the use of mathematical techniques and methods; experimental problems; analyzes the solution of theoretical and experimental problems in physics used at various stages of republican Olympiads.			v	v	v						v		

64		PD	KV	Workshop on solving mathematical problems	**Purpose:** in-depth study of elementary mathematics sections. **Content:** The discipline belongs to the variable part of the main educational program. The tasks are solved in the following sections: simplification of expressions, various types of equations and inequalities, the study of a function, trigonometry, Newton's binomial, text problems with its structures and classifications. The methods and methods of solving text problems, modeling in the process of solving problems are studied. Analysis of current trends in the development of current elementary mathematics; applications of elementary mathematics	4		v	v	v						v		
65		PD	KV	Methodological foundations of problem solving	**Purpose**: to study various methods and techniques for solving mathematical problems of a certain complexity. In the study of logical analysis, algorithmization, modeling and other methods necessary to solve problems. **Content:** based on the analysis of scientific and methodological literature, comparison, generalization, study of pedagogical experience, a model of the problem solving process is proposed, represented by four stages: condition analysis, drawing up a solution plan, implementing a solution plan, studying the solution			v	v	v						v		

					found. The procedural component of the methodology of teaching students to solve mathematical problems in algebra, geometry, trigonometry, and the basics of analysis is considered.													
66		PD	KV	Workshop on solving geometric problems	**Purpose:** to learn how to solve geometric problems on a plane and in space using geometric methods and techniques. **Content:** in the course of practical classes, solves the problems of constructing, calculating areas and perimeters, as well as other problems of high-complexity planimetry and stereometry. Students' knowledge of solving non-standard tasks is formed. The main stages, techniques and methods of solving problems of this type are analyzed. Attention is drawn to the fact that students generalize heuristic techniques of mental activity, considering the subsequent solutions of problems and involving students in the independent compilation of tasks.	6		v	v	v						v		
67		PD	KV	Workshop on solving stereometric problems	**Purpose**: Familiarity with the basic methods of solving problems of stereometry, the study of the basic methods of solving geometric problems, the development and formation of educational and cognitive activity. **Content**: Knowledge and			v	v	v						v		

					understanding of methods and techniques for solving stereometric problems. Ability to solve stereometry problems by coordinate and vector methods. Formation of graphic culture in the construction of polyhedron models. Development of spatial representation and imagination. Ability to solve problems of an increased level of complexity.													
68		PD	VK	Industrial 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	5										v	v	v

					experience of independent professional activity.													
69	Module for acquiring new professional competencies	DB	KV	Disciplines according to the additional educational program	Additional educational program (Minor)-a set of disciplines and modules and other types of academic work elected by the student for study in order to form additional competencies.	12			v								v	v
70	Module of final certification	PD	VK	Pre-graduate or industrial practice	**Purpose**: acquisition of experience in independent research work; collection of materials for the performance of qualification work; consolidation of theoretical knowledge, acquired practical experience, as well as individual work skills. **Content:** During the internship, the student collects and analyzes materials, summarizes them for use and interpretation in his work; conducts the necessary research for the practical part of the thesis; conducts classes and attends classes of experienced teachers; draws up a plan for writing a thesis and coordinates it with his supervisor; writes a report of pre-graduate practice.	4									v	v	v	v
71				Writing and defending a thesis, graduation project, or preparing and passing a	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	8									v	v	v	v

				comprehensive exam	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														

5. SUMMARY TABLE REFLECTING THE VOLUME OF LOANS DISBURSED BY MODULES OF THE EDUCATIONAL PROGRAM

Course of study	Semester	Number of modules to be mastered	Number of subjects studied			Number of credits KZ				Total in hours	Total loans KZ	Quantity	
			OK	VK	KV	Theoretical training	Educational practice	Production practice	Final certification			exam	dif offset
1	1	4	5		2	30				900	30	6	1
	2	3	4		2	29	1			900	30	5	2
2	3	6	2	4	2	29		1		900	30	6	3
	4	6	1	3	3	28		2		900	30	6	2
3	5	6	1	2	3	28		2		900	30	5	1
	6	5			3	26		4		900	30	3	1
4	7	5		1	5	33		10		1290	43	5	2
	8	2						9	8	510	17		2
total		14	13	10	20	203	1	28	8	7200	240	36	14

6. LEARNING STRATEGIES AND METHODS, MONITORING AND EVALUATION

Learning strategies	Student–centered learning: The student is the center of teaching/learning and an active participant in the learning and decision-making process. Practice-oriented training: orientation to the development of practical skills.
Teaching methods	Conducting lectures, seminars, various types of practices with: • the use of innovative technologies: • problem-based learning; • case study; • work in a group and creative groups; • discussions and dialogues, intellectual games, olympiads, quizzes; • reflection methods, projects, benchmarking; • Bloom's taxonomies; • presentations; • rational and creative use of information sources: • multimedia training programs; • electronic textbooks; • digital resources. 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). Assessment forms: • survey in the classroom; • testing on the topics of the discipline; • * control works; • protection of independent creative works; • discussions; • trainings; • colloquiums; • essays, etc. Boundary control at least twice during one academic period within the framework of one academic discipline. Intermediate certification is carried out in accordance with the working curriculum, academic calendar. Forms of holding: • exam in the form of testing; • oral examination; • written exam; • combined exam; • project protection; • protection of practice reports. Final state certification.

7. EDUCATIONAL AND RESOURCE SUPPORT OF THE PLO

Информационно ресурсный центр	The structure of the JRC has 6 subscriptions, 16 reading rooms, 2 electronic resource centers (ERC). The basis of the network infrastructure of the OIC consists of 180 computers with Internet access, 110 automated workstations, 6 interactive whiteboards, 2 video doubles, 1 videoconferencing system, 3 A-4 scanners, the software of the OIC – AIBS "IRBIS-64" for MSWindows (a basic set of 6 modules), an autonomous server for uninterrupted operation in the IRBIS system. The library fund is reflected in the electronic catalog available to users on the website http://lib.ukgu .kz is on-line 24 hours 7 days a week. Thematic databases of its own generation have been created: "Almamater", "Works of scientists of SKSU", "Electronic Archive". Online access from any device 24/7 via an external link http://articles.ukgu.kz/ru/pps . Catalogs are processed electronically. The EC consists of 9 databases: "Books", "Articles", "Periodicals", "Works of the teaching Staff of the UCU", "Rare books", "Electronic Fund", "UCU in print", "Readers" and "SKO". 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 university's information network for faculties and departments; remotely on the library's website http://lib.ukgu.kz /. Access to international and republican resources is open: "SpringerLink", "Envoy", "Web of Science", "EVSSO", "Epigraph", to electronic versions of scientific journals in open access, "Zan", "RMEB", "Adebiet", Digital library "Akpigress", "Smart-kitar", "Kitar.kz", etc. For people with special needs and disabilities, the library's website has been adapted to the work of visually impaired users in the JRC
Material and 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, a computer class that meets the requirements of the SES. The Department of "Physics" includes 9 classrooms (215, 219, 222, 224, 226, 228, 230, 232, 215) in building No. 7, with a total area of 328.3 m2. Room 219 (74.4 m2) is an auditorium where various types of classes are held. Room 228 (51.8 m2) is a teaching room. 215 office with an area of 35 m2 is a utility room. 222 room (35.7 m2) computer room, where 13 computers are installed. 226 office (28.4 m2) laboratory of Mechanics and Molecular Physics. 224 (26.1 m2) office laboratory of Electromagnetism. 230 office (34.7 m2) laboratory of TSE and astronomy. 232 office (42.2 m2) laboratory of Optics, atomic and nuclear physics (an interactive whiteboard is installed here).

APPROVAL SHEET

on the educational program "6B01521 Mathematics-Physics"

Director of DAA _____ Naukenova A. S.

Director of DASc _____ Nazarbek U.B.

Director of the DE&C _____ Bazhirov T. S.

Department of Education of
Shymkent "Methodological Center"
methodologist in Physics _____ Salibekova M.Sh.