MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE REPUBLIC OF KAZAKHSTAN
M.AUEZOV SOUTH KAZAKHSTAN UNIVERSITY

AUEZOV
UNIVERSITY
1943

EDUCATIONAL PROGRAM

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MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE REPUBLIC OF KAZAKHSTAN

M.Auezov SOUTH KAZAKHSTAN UNIVERSITY

EDUCATION PROGRAMME

6B01531 – Mathematics-Computer science

Registration Number	
Code and Classification of Education	6B01-Pedagogical Science
Code and Classification of Areas of Training	6B015 - Teacher training of in science subjects
Group of educational programs (EP)	B009- Mathematics teacher training
Type of EP	acting
ISCE level	6
NQF level	6
IQF level	6
Language learning	Kazakh, Russian
The complexity of EP	240 credits
Distinctive features of EP	-
Partner University (JEP) -	-
University partner (DDEP) -	-

Shymkent, 2023.

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Drafters:

Name	Position	Sign
Kozhabekova A.E.	Senior teacher, Department of Computer Science	
Nyzanov E.A.	Professor of the Department of Computer Science	
Adyrbekova G.M.	Head of the Planning center of training programs of Department of Academic Affairs	
Zhaidakhayeva L.K.	Head of Department of Computer Science	
Robbekova M.	Student of the group EP-20-17k	
Kaikenova G.Zh.	The director of the Gymnasium No. 26 named after him. Zhambyl	
Sauranbayev Zh.S.	Director of the specialized boarding school No. 2 with instruction in three languages	
Utegenov M.K.	Director of the GCCP College of GZHT Manapa Utebayeva	
Myrzagalieva A.S.	Director of the South Kazakhstan College of Humanities and Economics	
Nurmukhanbetova G.K.	Director of «KaztilDamu» LLP, The educational center	

The EP was considered in the direction of training "B009- Mathematics teacher training" at a meeting of the academic committee, Minutes № 4 «6» 02 2025 y.

Chairman of the Committee _____

The EP was considered and recommended for approval at Educational-methodical meeting of M. Auezov SKU
Minutes № 4 «20» 02 2025y.

Chairman of the EMM _____ Abisheva R.D.

The EP was approved by the decision of the Academic Council of the University
Minutes №5 «21» 02 2025 y.

CONTENT

1. CONCEPT OF THE PROGRAM

The mission of the University	We are focuced 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. • 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.
The uniqueness of the educational program	1. The choice of modern innovative forms and methods of teaching, learning strategies in teaching mathematics and computer science. 2. Explanation of the fundamental foundations of the sections of mathematics and computer science. 3. Planning of training sessions taking into account the principles of integration and continuity of training at all levels of education. 4. Formation of students' readiness to organize and conduct research and practical activities in the field of mathematics, computer science, teaching methods, introduction of innovative technologies. 5. Development of didactically integral electronic learning complexes in mathematics and computer science.
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 (Protocol of the Academic Council No. 8 dated 31.01.2020).
Regulatory and legal framework for the development of EP	1. Law of the Republic of Kazakhstan "On Education"; 2. Standard rules of activity of educational organizations implementing educational programs of higher and (or) postgraduate education, approved by Order of the Ministry of Education and Science of the Republic of Kazakhstan dated October 30, 2018 No. 595 with amendments and additions dated December 29, 2021 No. 614 3. State obligatory standards 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 organizing the educational process on credit technology of

	education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated April 20, 2011 No. 152; 5. Qualification directory of positions of managers, specialists and other employees, approved by order of the Minister of Labor and Social Protection of the Population of the Republic of Kazakhstan dated December 30, 2020 No. 553. 6. Guidelines for the use of ECTS. 7. Guidelines for the development of educational programs for higher and postgraduate education, Appendix 1 to the order of the Director of the Center for the Bologna Process and Academic Mobility 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 the Educational program	• 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 for admission to training in educational organizations implementing educational programs of higher and postgraduate education by Order of the Ministry of Education and Science of the Republic of Kazakhstan No. 600 dated 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. PASSPORT of the Educational Programm

Purpose of the EP	Preparation of the popular teacher in mathematics and computer science in the framework of the updated educational content.
Tasks of the EP	-the formation of socially responsible behavior in society, an understanding of the significance of professional ethical norms and adherence to these norms; - providing basic undergraduate training that allows you to continue learning throughout life, to successfully adapt to changing conditions throughout their professional careers; - ensuring the conditions for acquiring a high general intellectual level of development, mastering literate and developed speech, a culture of thinking and the skills of scientific organization of labor in the field of education using computers and information and communication technologies; - creation of conditions for intellectual, physical, spiritual, aesthetic development to ensure the possibility of their employment in the specialty or continuing education at subsequent levels of education.
Harmonization of EP	• 6th level of the National Qualifications Framework of the Republic of Kazakhstan; • Dublin descriptors of the 6th level of qualification; • 1 cycle of a Framework for Qualification of the European Higher Education Area); • 6th Level of European Qualification Framework for Life long Learning).
Connection of EP with the professional sphere	Professional standards “Teacher” (order No. № 500 of 15.12.2022), “Database administration”, “Software development”. The sectoral framework of qualifications in the field of education, approved by Minutes No. 2 of the meeting of the sectoral tripartite commission on social partnership and regulation of social and labor relations under the Ministry of Education and Science of the Republic of Kazakhstan dated November 23, 2016.
Name of the degree awarded	After successful completion of this OP, the graduate is awarded the degree: Bachelor of Education according to the educational program "6B01531 - Mathematics-Computer Science"
List of qualifications and positions	Bachelors in the OP "6B01531 - Mathematics-Computer Science" can hold primary positions of a trainee teacher in mathematics and computer science in the centers of pedagogical excellence, departments of education using computers and information and communication technologies, interactive technologies without presenting work experience requirements in accordance with qualification requirements. 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 May 21, 2012 No. 201-o-M.
Field of professional activity	Is the field of education
Objects of professional activity	educational institutions of state and non-state funding; schools, lyceums, gymnasiums; organizations of science: scientific, research centers in the field of mathematics, applied mathematics, pedagogy, psychology and teaching methods; management organizations: state governing bodies, departments of education; organizations of various forms of ownership using methods of mathematics and computer science, applied mathematics and computer science.

Subjects of professional activity	• The educational process in the unity of its value-oriented targets, content, methods, forms and results;
Types of professional activity	educational; - organizational and methodical; - experimental research; - organizational and managerial; - social and pedagogical; - educational.
Learning outcomes	**LO 1** - Free to communicate in a professional environment and society in Kazakh, Russian and English, taking into account the principles of academic writing and the culture of academic honesty. **LO 2** - Demonstrate socio-cultural, professional development based on the formation of ideological, civic, spiritual and social responsibility, methods of scientific and experimental research. **LO 3** - To make plans and conduct lessons taking into account the characteristics and needs of students, defining appropriate teaching methods and tools for evaluating students' academic achievements. **LO 4 -** Plan and make changes to the content of education taking into account new pedagogical technologies; **LO 5 -** Solve applied mathematical problems using mathematical devices and demonstrating mathematical thinking. **LO 6 -** Be able to convey the result of mathematical and applied research in the form of specific recommendations expressed in terms of the subject area of the phenomenon studied. **LO 7 -** Apply innovative technologies of teaching mathematics, methods of formation of subject skills, methods of formation of interest in mathematics of schoolchildren **LO 8 -** Be able to formulate and practically solve problems in the field of computer science, using information technologies in the field of professional activity, successfully carry out research activities. **LO 9 -** Design and implement computer systems using network resources and software tools. **LO 10** - To manage the behavior of students, motivating their educational and cognitive activity using the methodology of educational work, modern concepts of education **LO 11 -** Use research, entrepreneurial skills and skills in the face of uncertainty. **LO 12 -** To work effectively individually and as a team member, to plan professional continuing education in formal, informal, informational forms

3. COMPETENCES OF THE GRADUATE OF EP

SOFT SKILLS. Behavioral skills and personality qualities	
SS 1. Competence in managing one's own literacy	SS1.1. The ability of self-learn, self-develop and constantly update their knowledge within the chosen trajectory and in an interdisciplinary environment. SS1.2. The ability to express thoughts, feelings, facts and opinions in the professional field. SS1.3. The ability for mobility in the modern world and critical thinking.
SS 2. Language competence	SS2.1. The ability to build communication programs in the state, Russian and foreign languages. SS2.2. The ability for interpersonal social and professional communication in the conditions of intercultural communication.
SS 3. Mathematical Competence and Competence in the field of Science	SS3.1. 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 solve professional problems.
SS 4. Digital competence, technological literacy	SS4.1. The ability to demonstrate and develop information literacy through the mastery and use of modern information and communication technologies in all areas of their lives and professional activities. SS4.2. The 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 academic competencies	SS5.1. The ability for physical self-improvement and focus on a healthy lifestyle to ensure full-fledged social and professional activities through the methods and means of physical culture. SS5.2. Knowledge of the Rules of pedagogical ethics. SS5.3 The ability to build a personal educational trajectory throughout life for self-development, career growth and professional success. SS5.4. The ability to successfully interact in a variety of socio-cultural contexts during study, work, home and leisure.
SS 6. Entrepreneurial competence	SS6.1. The ability to be creative and entrepreneurial in a variety of environments. SS6.2. The ability to work in a mode of uncertainty and rapidly changing task conditions, make decisions, allocate resources and manage your time. SS6.3. The ability to work with consumer requests.
SS 7. Cultural awareness and ability to express yourself	SS7.1. The ability to show worldview, civil and moral positions. SS7.2. The ability to be tolerant of the traditions and culture of other peoples of the world, to have high spiritual qualities.
PROFESSIONAL COMPETENCIES (HARDSKILLS).	
Theoretical knowledge and practical skills specific to this field	PC-1.The ability to master knowledge in the field of pedagogy, psychology, pedagogical innovation, pedagogical technologies, to be able to innovate, strive for excellence in pedagogical skills, show initiative and diligence; the ability to master knowledge in the field of psychological and pedagogical sciences, to analyze the significance of human development and the physiology of the development of schoolchildren; their application in psychological and pedagogical sciences.pedagogical practice.
	PC-2. Knowledge of the basics of mathematical analysis and modeling

	methods, theoretical and experimental research; readiness to use the main directions of school mathematical education with updated content; scientifically substantiate the mathematical concepts of the course that are studied at school. To use basic knowledge of computer science in research, to apply modern information technologies in their teaching activities: the construction of computer training programs, their use in professional activities.
	PC-3. Knowledge of the theoretical foundations and methods of teaching mathematics and computer science in the conditions of specialized training; the ability to quickly and correctly make a decision in non-standard situations; use modern programming methods in developing effective techniques and technologies for finding a unique algorithm for solving applied problems in terms of efficiency and capabilities.
	PC-4. The ability to demonstrate professional values (commitment to the profession of a teacher, citizenship, compliance with professional ethics, responsibility, proactivity). Performs his professional activity on the basis of respect and responsibility, honesty and fairness.

3.1 Matrix of correlation of learning outcomes for the EP as an whole with the formed competencies of the modules

	LO1	**LO2**	**LO3**	**LO4**	**LO5**	**LO6**	**LO7**	**LO8**	**LO9**	**LO10**	**LO11**	**LO12**
KC 1			+	+	+	+	+					
KC 2	+	+										
KC 3					+	+	+	+	+	+	+	
KC 4					+	+	+	+	+	+		+
KC 5		+	+	+	+	+	+	+			+	+
KC 6									+	+	+	+
KC 7											+	
SC 1			+	+								
SC 2					+	+	+	+	+			
SC 3					+	+	+	+	+			+
SC 4		+					+			+		

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

Module name	CYCLE		Component Name	Brief course description (30-50 words)	Number of credits	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11	LO12
Fundumentals of the Public Sciences	GED	OC	History of Kazakhstan/	**The purpose** of the discipline is formation of an objective idea of the history of Kazakhstan based on a deep understanding and scientific analysis of the main stages, patterns and originality of the historical development of Kazakhstan. **Contents:** Ancient people and the formation of nomadic civilization. Turkic civilization and the great steppe. Kazakh Khanate. Kazakhstan in the era of modern times. Kazakhstan as part of the Soviet administrative-command system. Declaration of Independence of Kazakhstan. State system, socio-political development, foreign policy and international relations of the Republic of Kazakhstan. Methods and techniques of historical description for the analysis of the causes and consequences of events in the history of Kazakhstan.	5		V										
	GED	OC	Philosophy	**Purpose:**The formation of a holistic idea among students about philosophy as a special form of knowledge of the world, about its main sections, problems and methods of studying them in the context of future professional activity. And also the formation of philosophical reflection, introspection and moral self-regulation among students. **Content:** Emergence of a culture of thinking. Subject and method of philosophy. Fundamentals of philosophical understanding of the world: questions of consciousness, spirit and language. Being. Ontology and metaphysics. Cognition and creativity. Education, science, technology and technology. Human philosophy and the world of values. Ethics. Philosophy of values. The subject of aesthetics as a field of philosophical knowledge. 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 Kazakhstan philosophy.	5		V										

Socio-Political knowledges	GED	OC	Social and Political Studies	**Purpose:** The goal of forming knowledge about social and political activities, explaining social and political processes and phenomena. **Content:** Consideration of the system of socio-ethical values of the society. Ways to use social, political, cultural, psychological institutions, features of youth policy in the modernization of Kazakhstani society and solve conflict situations in society and professional environment based on them. To study the methods of analysis and interpretation of political institutions and processes, ideas about politics, power, state and civil society, to understand and use the methods and methods of sociological, comparative analysis, to understand the meaning and content of the political situation in the modern world. Analysis and classification of the main political institutions.	4		V											
	GED	OC	Cultural Studies and Psychology	**Purpose:** the formation of scientific knowledge of history, modern trends, current problems and methods for the development of culture and psychology, the skills of a systematic analysis of psychological phenomena. **Contents:** 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. State Program "Cultural Heritage". National consciousness, motivation. Emotions, intellect. The will of man, the psychology of self-regulation. Individual typological features. Values, interests, norms are the spiritual basis. The meaning of life, professional self-determination, health. Communication of the individual and groups. Socio-psychological conflict. Models of behavior in conflict.	4				V								
	GED	HsC	Ecosystem and Law	**The purpose:** Formation of integrated knowledge in the field of economics, law, anti-corruption culture, ecology and life safety, entrepreneurship, scientific research methods. **Content:** Fundamentals of safe human-nature	5		V										

				interaction, ecosystem and biosphere productivity. The entrepreneurial activity of society 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 compliance of Kazakhstan's law, obligations and guarantees of subjects, state regulation of public relations to ensure social progress. Application of scientific research methods.													
Socio-ethnic Development	BD	EC	Abay Studies	**Purpose:** based on the creativity of A. Kunanbayev, the preservation of the «national code» and in the project «Kazakhtanu». **Contents:** 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, and 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. Auyezov «The Way of Abai». K. Tokayev «Abai and Kazakhstan in the XXI century», role, significance.	3	V												V
	BD	EC	Muhtar Studies	**Purpose:** Formation of 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 life and creative path of M. Auezov Semipalatinsk, Tashkent, St. Petersburg periods. M. Auezov's activity in the magazines «Sholpan», «Abai». M. Auezov's journalism. An artistic review of the short stories "Korgansyzdyn kuni", "Kyr suretteri", "Okagan azamat", "Kokserek", the play Enlik-Kebek and the stories "Kili Zaman", "Karash-Karash" okigasy", the monograph "Abai Kunanbayev", the epic novel "Abai Zholy".		V												
		EC	Actual Problems	The **purpose** of the discipline is the restoration of		V												

	BD		and Modernization of National Awareness	spirituality, deformed during the periods of tsarist and Soviet reality, the formation of a creative personality based on the modernization of the public consciousness of young people. **Content:** Spiritual modernization: origin and background. 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. Fatherland is the basis of the state. Education through nationwide sacred places and history. Modern Kazakh culture is the cornerstone of spiritual revival. New humanitarian education and the future national intelligentsia. Abai Kunanbaev and Kazakh society.														
	BD	EC	Service to Society	**The aim** is the formation of socially significant skills and competencies in 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. Key components of Service Learning, socially useful activities in the children's and youth environment, organization of volunteer movement in the world and Kazakhstan practice, 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												
	BD	EC	Foundations of Anticorrupsion Culture	**Purpose:** formation of an anti-corruption worldview, strong moral foundations of a personality, civic position, stable skills of anti-corruption behavior. **Content:** Overcoming legal nihilism, formation of the basics of students' legal culture in the field of anti-corruption legislation. Formation of a conscious perception/attitude towards corruption.Moral			V										

				rejection of corrupt behavior, corrupt morality and ethics. Development of skills necessary to fight corruption.Development of anti-corruption standards of conduct. Anticorruption propaganda, dissemination of lawfulness and respect for the law. Activities aimed at understanding the nature of corruption, awareness of social damage caused by its manifestation, ability to defend one's position with arguments, seeking ways to overcome manifestation of corruption.													
Communication and Physical Training/	GED	OC	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. **Contents:** Levels A1, A2, B1, B2-1, B2-2 (B2, C1 Russian language) are presented in the form of cognitive-linguocultural complexes, consisting of spheres, themes, sub-themes and typical situations of communication of the international standard: social, social-cultural, educational and professional, modeled by forms: oral and written communication, written speech works, listening. Demonstration of understanding of the language material in the texts on the educational program, knowledge of terminology and development of critical thinking.	10	V												
	GED	OC	Foreign Language	**Purpose:** The aim is a formation of students' intercultural and communicative competence in the process of foreign language education at a sufficient level A2 and a level of basic sufficiency B1. Student reaches B2level of common European competence if the language level at the start is higher than B1level of common European competence **The contents:** Levels A1, A2, B1, B2 are presented in the form of cognitive-linguocultural complexes, consisting of spheres, themes, sub-themes and typical situations of international standard's communication: social, social - cultural, educational and professional, modeled by forms: oral and written communication, written speech works, listening. Demonstration of language material understands in texts on educational program, knowledge of	10	V												

				terminology and critical thinking development.													
	GED	OC	Physical Training/	**Objective**: the formation of social and personal competencies and the ability to purposefully use the means and methods of physical culture that ensure the preservation and strengthening of health in preparation for professional activity; to the persistent transfer of physical exertion, neuropsychic stresses and adverse factors in future work. **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. Refereeing competitions. Means of professionally applied physical training. Modern health-improving systems: the breathing system according to A. Strelnikova, K. Buteyko, K. Dinaiki, joint gymnastics according to Bubnovsky.	8	V											
	BD	HsC	Professional Kazakh (Russian) Language	**Goal:** to provide professionally oriented language training of a specialist who is able to competently construct communication in professionally significant situations and speak the language norms for special purposes. **Content:** Professional language and its components. Professional terminology as the main feature of scientific style. Scientific vocabulary and scientific constructions in educational-professional and scientific-professional spheres. Algorithm of work on the analysis and production of scientific texts on specialty. Producing scientific and professional texts. Basics of business communication and documentation within the framework of future professional activity.	3	V										V	
	BD	HsC	Professionally Oriented Foreign Language	**Purpose:** The discipline examines the basic concepts and terms of computer science. **Contents:** the content of the computer science course in English; techniques for annotating, referencing and translating literature in the specialty; the use of special professionally-oriented material in the computer science lesson is discussed; the analysis of	3	V										V	

				texts in English is carried out; examples of the use of English in professional activities are given													
	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. Development of new «digital» thinking, acquisition of knowledge and skills in the use of modern information and communication technologies in various activities **Content:** Introduction and architecture of computer systems. Software. Operating systems. Human-computer interaction. Database systems. Data analysis. Data management. Networks and Telecommunications. Cybersecurity. Internet technologies. Cloud and Mobile technologies. Multimedia technologies. Smart technology. E-technologies. Electronic business. Electronic government.	5	V	V			V								
Basics of Pedagogical Skills	BD	HsC	Pedagogy and Cyberpedagogy	**Purpose:** The aim is to equip future teachers with professional competencies on the theoretical and methodological foundations of modern pedagogical science, the technology of organizing the pedagogical process, the formation of students' readiness to design and construct the educational process based on information and communication technologies based on the laws and scientific principles of Cyberpedagogy. **Content:** The genesis of pedagogical science, regularities and principles of a holistic pedagogical process. Fundamentals of the theory of education and didactics. Problems of modern school management. Scientific principles and regularities of Cyberpedagogy, methodology and technology for managing the educational process based on information and communication technologies, methods of distance learning and blended learning..	5			V	V								
	BD	HsC	Inclusive Education	**Purpose:** The aim is familiarization with modern world and domestic theories of inclusive education, the formation of future teachers' professional competencies in the design and organization of	4			V	V								

				inclusive education. **Content:** Social significance and features of inclusive education. Patterns, principles and models of inclusive education, legal documents regulating the activities of inclusive education in a mass school. Approaches and technologies for organizing inclusive education in educational institutions. Methods of psychological and pedagogical support and creating a comfortable environment for inclusive education of children with special educational needs. Problems of creating an inclusive educational environment.														
	PD	HsC	Workshop of Special Disciplines	**Purpose:** the formation of skills and skills in solving problems of increased complexity. **Contents:** Problems of the increased complexity of the section "Programming", Problems of the increased complexity of the section "Theory of algorithms", Problems of the increased complexity of the section "Coding information", Problems of the increased complexity of the section "Algebra of logic", Tasks of the increased complexity of the section "Number systems" Use practical programming skills; - the possibilities of modern information technologies and development trends.	4								V	V	V		V
	BD	HsC	Pedagogical practice	**Purpose:** to form professional and pedagogical skills aimed at updating, accumulating and deepening special basic knowledge in professional pedagogy. Collection of information about the activities of an educational institution and the professional activities of a teacher, analysis of regulatory documents that determine the content of education according to the updated program, instilling skills in mastering the practical foundations of a future profession, developing skills in collecting, accumulating empirical material, skills in structuring, systematizing knowledge, presenting them in various ways, skills in public speech and report presentation.	1			V								V	

Fundamentals of Psycho-Pedagogical Sciences	BD	HsC	Fundamentsls of General and Age Psychology	**Purpose:** development of psychological thinking of students on the basis of studying and mastering knowledge of various mental phenomena, taking into account the age-related characteristics of the development of the human psyche. **Contents:** introduction to psychology. Consciousness. Personality. Activity. cognitive processes. Psychology of will, emotions, feelings. Temperament. Character. Capabilities. Structure, functions, laws of the psyche, cognitive processes, conditions, factors, mechanisms of development of the psyche in ontogenesis. Methodological foundations of developmental psychology, concepts, categories, mechanisms, nature of age-related transformations. Features, causes and factors, conditions and prospects for the positive development of the personality at different age stages of the development of the human psyche.	4		V		V								
	BD	HsC	Physiology of Schoolchildren Development	**Purpose:** is to give the future teacher up-to-date information about the anatomical and physiological features of the body of children and adolescents, its relationship with the environment, to equip with knowledge about the laws underlying the preservation and strengthening of the health of schoolchildren, maintaining their high efficiency in various types of educational activities. **Content:** The growth and development of the body. The development of the nervous system, the formation of higher nervous activity and its formation in the process of child development; features of the development of sensory; endocrine; musculoskeletal system; respiratory system; digestive; blood and cardiovascular system. The basics of protecting the health of schoolchildren, familiarization with the rules of a healthy lifestyle.	4				V								
	BD	HsC	Theory and Methodology of Educational Work	**Purpose:** the formation of professional competencies of future teachers in the design, construction and organization of upbringing work at school. **Content**: The essence and features of the upbringing process, upbringing work, systems of upbringing of	4			V	V						V		V

				the school and class. Functions and content of the class teacher. Skills in planning upbringing work at school and in the classroom, organizing a class team and individual upbringing work with students. Skills of pedagogical support, work with difficult and gifted children, methods of cooperation with parents of students. Career guidance work with students. Methods for diagnosing the effectiveness of upbringing work.														
	BD	HsC	Psycho-pedagogical practice	**Purpose:** Familiarity with the content of psychological and pedagogical work of the class teacher. Familiarity with the documentation and activities of the class teacher on psychological and pedagogical support of the educational process. Familiarity with the content of activities and documentation of psychological and pedagogical work of the subject teacher.	2			V	V							V	
Methodical fundamentals of teaching computer science	PD	EC	Introduction to the Specialty	**Purpose:** familiarization of students with the concept and structure of the information society, ways of presenting information, principles of operation and organization of personal computer devices. **Content**: regularities in development of Informatics , communication of Informatics with production, interrelation of development of Informatics with development of other Sciences are considered, the basic methods of knowledge at the empirical and theoretical level are described.				V	V	V	V	V	V				
	PD	EC	Fundamentals of academic writing	**Purpose:** to teach how to maintain, install and eliminate errors of network devices and network software, i.e. the ability to install, configure and maintain operating systems and network devices of an infocommunication system, to ensure the network security of the organization; **Content:** to determine, simulate the logical and physical structure of the database, to install, configure, deploy, maintain, optimize the functioning of databases and DBMS, to monitor, manage and analyze big data in storage, to ensure the information security of the database;	4			V	V	V	V	V	V				

	PD	HsC	Methods of Teaching and Assesment in Informatics	**Purpose:** the purpose of studying the discipline is theoretical and practical training of students in the field of modern methods of teaching propaedeutic and basic computer science courses in the main school and specialized courses at the senior level, the acquisition of practical skills for effective educational and educational work in General and specialized schools; the development of creative potential necessary for teaching computer science in the conditions of differentiation of schools. **Content:** Computer science as a field of education.Methods of teaching computer science as a sphere of pedagogical science. Documents regulating computer science education. Content and structure of school education in computer science. Didactic principles and methods of teaching computer science. Organization of computer science education in modern schools. Extracurricular and extracurricular work in computer science. Organization of students ' work in the computer science room. Computer science course software. Basic concepts of computer science and methods of teaching it. Task system as a means of teaching computer science. Methods of teaching the introductory course in Informatics. Methods of teaching the basic course of school Informatics. Differentiated computer science education at the senior school level	6					V	V		V	V	V		V
	PD	EC	Methods of Teaching and Assesment in Mathematics	**Purpose:** formation of students' ability to apply various methods of teaching mathematics, the content of teaching mathematics at school. **Content:** scientific methods, principles and analysis of teaching mathematics. Planning a math lesson in accordance with modern requirements; organization of the educational process in mathematics. Methods of explaining mathematical material and methods of evaluation	4					V	V	V					
	PD	EC	Private Methods of Teaching Mathematics	**Purpose:** to develop students' skills and abilities in effective and high-quality teaching of mathematics using advanced techniques. **Content:** they study methods and strategies of						V	V	V					

				teaching mathematics, as well as get acquainted with modern methods of teaching mathematics in various educational institutions. They study various technologies and tools that can be used in teaching mathematics, such as computer programs, interactive whiteboards, etc.														
	BD	HsC	Educational Practice	**Purpose:** Improvement of own qualification and skills; ability to develop, compile, test and document programs in programming languages; application of the concept of structural and object-oriented approach in software development; skills of preparation of presentation software for the subject area.	1										V	V	V
Introduction to mathematical analysis and integral calculus	BD	EC	Differential Calculus of One Variable Function	The **purpose** of the discipline: to study the basic methods of studying variables, the theory of series, finding the derivative of a function. **Content:** The theory of limits of functions, differential calculus of functions of one variable, the derivative of basic elementary functions are considered. Application of differentiation rules and differentiation formulas when finding the derivative of functions. The ability to solve problems of finding the limits of functions, the derivative of complex functions (given implicitly, parametrically), to investigate the function using the derivative	6					V	V	V					
	BD	EC	Differential Calculus of Function of Many Variables and Integral tasks	The **purpose** of the discipline: to present the concept of multidimensional calculus and its application in solving applied problems. **Content:** The basic concepts and methods of differential calculus of functions of many variables, the theory of numerical and functional Fourier series are considered. The ability to differentiate, to investigate the functions of several variables at an extreme, to calculate the limit values of functions, to calculate approximate values of functions, to be able to investigate numerical and functional series.						V	V	V					
	BD	EC	Integral Calculus of One Variable	**Purpose:** To present the concept of integral calculus with one variable and its application in solving applied problems. **Content:** Integration operations, concepts of a primitive function, an indefinite integral, and its	4					V	V	V					

				properties are considered. Ability to choose the appropriate integration method (integration by parts, variable replacement, integration of rational functions, irrationalities, differential binomials, trigonometric and transcendental functions) when solving problems; use the table of basic indefinite integrals.														
	BD	EC	Applications of One Dimensional Integral	The **purpose** of the discipline: to study the methods of integral calculus of functions of many variables; the rules for calculating multiple integrals, curved integrals, improper integrals. **Content:** The physical and geometric meaning of the double and triple integrals, their properties, and the application of the integral of the function of many variables are considered. Ability to calculate double and triple integrals. Knowledge of the skills of replacing a variable in a double and triple integral. The ability to apply multiple integrals in mechanics						V	V	V					
	PD	EC	Differential Equations	**Purpose:** To study methods for solving differential equations. **Content:**The basic concepts and definitions of the theory of ordinary differential equations are considered; methods of integration of certain types of equations of the first and higher orders; theorems of the existence of solutions of differential equations. The ability to integrate linear homogeneous and inhomogeneous differential equations of the second and higher orders with constant coefficients and their systems.	4					V	V	V					
	PD	EC	Theory of Operators Transformations	**The purpose** of the discipline: to study the complex of functions acting as canonical solutions of the Bessel differential equation and their properties; **Content:** the ability to apply the Bessel function in solving problems of wave propagation, problems of statistical potentials, signal processing, problems of thermal conductivity in cylindrical objects, etc. The ability to calculate transients by the operator method, the ability to apply the knowledge gained in solving problems.						V	V	V					

	PD	HsC	Educational and methodical (pedagogical) practice	**Purpose:** mastering the main activity of the pedagogical activity of a mathematics of computer science teacher and the formation of future teachers as professional and personal. Educational and methodological practice is carried out in conditions close (similar) to the main pedagogical activity. Pedagogical practice is a form of professional training of students at a university, based on a well-known theoretical foundation, providing practical knowledge of the principles and patterns of professional activity of a teacher and mastering the techniques of its organization. The activities of student interns during the internship are characterized by: informative, developmental, organizational, versatility, research, etc. During the internship, students work as teachers of mathematics, computer science and assistants to the class teacher.	2			V							V	V	
Алгебра және геометрия/ Алгебра и геометрия/ Algebra and Geometry	BD	EC	Analitical Geometry	**Purpose:** to consider lines and surfaces of the second order, to be able to use them in Applied Mathematics. **Content:** vector algebra, elements of analytical geometry on the plane and in space, lines and surfaces of the second order are considered. Ability to find scalar, vector, mixed products of vectors;	4					V	V	V					
	BD	EC	Theory of Determinants	**Purpose:** to consider the foundations of the theory of determinants and their main properties. **Contents:** Matrix, determinants, their properties. Kramer's formula for solving a system of linear algebraic equations. Fluency in special types of determinants: Vronsky, Vandermond, gram, Jacobi determinant. The best way to calculate determinants.						V	V	V					
	BD	EC	Algebra and Numbers Theory	**Purpose:** To consider the basic concepts of Algebra and number theory and theoretical knowledge about the normal form of Zhordan. **Content:** Group theory, acquisition of practical skills with activities in the group. To use the methods of algebra and number theory to solve mathematical problems; to master the methods of algebra for the study of various applied problems.	4					V	V	V					

	BD	EC	Linear Algebra	**Purpose:** To consider the basic concepts and theorems of Linear Algebra. **Content:** calculation of a system of Linear Equations by The Kramer and Gauss method, using the Grebner basis; finding the inverse Matrix and rank of a matrix, the ability to divide polynomials by the remainder; using the Euclidean algorithm, Gorner's scheme, the Sturm method when solving linear algebra problems.						V	V	V					
	PD	EC	Complex Analysis	**The purpose** of the discipline: to study the set of complex numbers, their properties and the rules of action on them. The ability to represent complex numbers in trigonometric and exponential forms. **Content:** The basic concepts, formulas, theorems and definitions of the theory of functions of a complex variable are considered; various forms of writing a complex number; series in the complex plane; function deduction. Knowledge of differentiation and integration of functions of a complex variable; Cauchy's theorem; Cauchy integral and Cauchy integral formula.	4					V	V	V					
	PD	EC	Filed Theory	**The purpose** of the discipline: to study the properties of fields that generalize basic mathematical operations (addition, subtraction, multiplication, division) and their applications. **Content:** The basic concepts of field theory are considered: scalar field, surfaces and level lines, directional derivative, gradient, vector field, flow, divergence, Ostrogradsky-Gauss formula, circulation, rotor, Stokes formula, Hamilton operator, vector differential operations of the first and second orders.						V	V	V					
	BD	EC	Theory of Probability and Mathematical Statistics	**The purpose** of the discipline: to study the patterns of random events and random variables, properties and basic operations on them; elements of statistics. **Content:** The basic concepts of probability theory are considered: axiomatics, random events. The ability to use basic techniques and methods for determining the probabilities of complex events, methods for describing and determining random variables, limit theorems of probability theory.	4					V	V	V					

				Ability to calculate probabilities of random events, find numerical characteristics of random variables, solve mathematical statistics problems. Knowledge of probabilistic methods in scientific research.														
	BD	EC	Theory of Graphs	**The purpose** of the discipline: to teach the basic methods of mathematical description of the structure of various objects. **Content:** The basic concepts of graph theory are considered. Features of oriented and undirected graphs; define graph elements, ways to define graphs. Freely operates with the concepts: incident matrix, vertex neighborhood matrix, vertex degrees, chain and path, cycle and contour, trees, Eulerian graphs. Ability to apply basic formulas to solve graph theory problems.						V	V	V					
	BD	EC	Mathematical Logic and Discrete Mathematics	**The purpose** of the discipline: teaching methods for solving problems of discrete mathematics, the study of discrete structures – finite graphs, set theory, relations, functions and statements in logic. **Content:** Mathematical structures and methods of analysis of discrete objects and processes. The study of statements, logical operations, the concepts of implication, logical consequence and equivalence. It includes graph theory, combinatorics, coding theory, automata and information theory. Students develop logical thinking and the ability to apply methods in practical tasks.	4					V	V	V					
	BD	EC	Action Research	**The purpose** is to teach students various methods of investigating actions in mathematical structures. **Content:** They study concepts related to actions, such as groups, rings, fields and other algebraic structures, and master methods for studying their properties and applications. In addition, they study group representation theory and algebraic topology, which are used in solving various problems in mathematics and its applications. The main content of the discipline includes theoretical and practical aspects of the study of actions in mathematics, as well as their application in various fields of science and technology.						V	V	V					

	PD	EC	Differential Geometry	**The purpose** of the discipline: the study of smooth manifolds having additional structures. **Content:** Geometric images such as curves and surfaces are studied by mathematical analysis methods. Such subsections as differential geometry of curves and surfaces, Riemannian geometry are discussed. The discipline serves as a support for the subsequent study of various mathematical disciplines.	4					V	V	V					
	PD	EC	Topology	**The purpose** of the discipline: familiarity with the basic terms, sections, tasks and methods of topology, its applications. **Content:** The phenomenon of continuity, the properties of spaces that remain unchanged under continuous deformations are studied. The basics of topology are applicable to the study of other mathematical disciplines. Solid practical skills of solving topology problems are formed.						V	V	V					
	BD	EC	Workshop on solving mathematical and geometric problems	**Purpose:** A discipline aimed at developing students ' skills in solving mathematical problems of high complexity. **Content:** Olympic reports. Problems of high complexity. Text reports. Applied problems of practical importance. In this process, methods for solving problems are studied, as well as practical classes are held in which students perform their tasks in this area, practice solving problems.	6					V	V	V					
	BD	EC	Methodical Fundamentals of Solving Problems	**Purpose:** To study various methods and techniques for solving mathematical problems of a certain complexity. **Contents:** Rational, trigonometric, irrational, logarithmic, exponential equations and systems of equations, their inequalities. The study of logical analysis, algorithmization, modeling and other methods necessary to solve problems.						V	V	V					
	PD	HsC	Educational and pedagogical practice	**Purpose:** Willingness to apply the legal framework of the Republic of Kazakhstan in the field of education, information technology in professional activities; the ability to apply the basic provisions of the science of mathematics and computer science in teaching and to own the content, forms and methods	4			V							V	V	V

				of educational work of teachers; interact with all participants in the educational process on the basis of tolerance, dialogue and cooperation.													
Hardware and software of a personal electronic computer	BD	EC	Modern Operating Systems	**Purpose:** Mastering the concepts of operating systems, the basic principles of designing and building operating systems; **Contents:** The fundamental principles of OS design are considered; principles of computer resource management; principles of virtualization and mobility of modern operating systems; the ability to implement basic algorithms for planning and synchronizing processes and flows; OS installation skills, user working environment settings, connection and configuration of hardware devices, disk and file system management, network settings.management.	5						V		V	V			
	BD	EC	System Administration of Operating Systems	**Purpose:** Formation of basic concepts, knowledge and skills in the organization of the functioning of modern operating systems, namely, the ability to create and use effective software to manage computing resources in multi-user operating systems; **Contents:** Obtaining basic, theoretical knowledge in the field of modern operating systems, the principles of organization of input/output and multi-program work, and the acquisition of practical skills of OS administration.							V		V	V			
	PD	EC	Fundamentals of Robotics and IT Technology	**Purpose:** To form knowledge about the history of robotics and the basics of students' knowledge; to master the basic techniques and design of robots related to perception, planning, responses. **Content:*** Ability to work in the LEGO® MINDSTORMS® Education EV3 and LEGO® Digital Designer programs; * application of theoretical knowledge gained in the disciplines of mathematics, physics, geometry and computer science in robotics systems; * apply the knowledge gained in group and project tasks; * synthesis of information obtained from several sources.	4						V		V	V			

	PD	EC	Automatic Control Theory	**Purpose:** Teaching students modern methods of description, analysis, synthesis and modeling of control systems and obtaining practical skills to solve specific problems of quality research and design of automatic control systems. **Contents:** Main characteristics of ACS elements. Quality and synthesis of ACS. Nonlinear control systems. Discrete system.							V		V	V			
	PD	HsC	Industrial and Pedagogical Practice II	**Purpose:** Pedagogical practice in the last year is the completion of the previous practice in organizing the educational process at school and is aimed at acquiring knowledge, skills and abilities to manage the entire pedagogical process and conduct practical work on a graduation project. Visiting and analyzing the lessons of teachers, subject teachers and other trainees, studying the program, textbooks, teaching and methodological and visual aids, equipment used by the subject teacher, developing lesson planning of their own pedagogical activities, lesson notes on the subject at various levels of education, electronic materials educational purposes, conducting lessons on the subject of the specialty.	5			V							V	V	V
Fundamentals programing	BD	EC	Programming Language C++	**Purpose:** to study the classification of programming languages, data types, operations, operators of the C programming language, to be able to program in C++; **Content:** -formation of students' general methodological foundations and practical skills in program development. -an idea of the general methodological foundations of program development; -understanding the structure of algorithms; -knowledge of basic data types and programming language constructs; Create a C++ programming project.	6								V				
	BD	EC	High-Level Programming Languages	**Purpose:** To give the student knowledge and practical skills in algorithmization, development, debugging and testing of programs. **Content:** Use practical programming skills; - opportunities of modern information technologies and development trends. Create a high-level programming project.									V				

	BD	EC	Object-oriented Programming in the C++ Environment	**Purpose:** To form an idea of the methodology of software development, technologies used in software. **Content:** Object-oriented programming in the C++ environment. Data input and output. Program structure. Project files. Description of the module. Compilation of the program. Basics of visual programming. Creating an app. Methods and principles of object-oriented programming. Encapsulation. Polymorphism. Arrays. Programming multidimensional arrays. Editing symbolic information. Lines. Graphical features of the C++ programming environment.Animated and multimedia functions in C++.	6								V				
	BD	EC	OOP Objective-C Programming Language	**Purpose:** The study of applied software interfaces for the creation of modern applications; the acquisition by students of basic knowledge in the field of modern OOP languages; **Contents:** the acquisition of knowledge in the field of building their own software interfaces; the acquisition of practical skills in creating applications; the development by students of tools for joint project work.									V				
	PD	EC	Programming in Python	**Purpose:** Knowledge of the basic structures and idioms of the Python programming language; Learning basic programming techniques, standard algorithms and construction of regular expressions in Python; Develop Python programming skills. **Contents:** The main content of the course consists of basic programming techniques in Python, standard algorithms and regular expressions. We consider the idea of the formats used to store text data, Python language tools for implementing algorithms, acquire sufficient programming skills in Python to solve practical problems.	4								V				
	PD	EC	Programming in Arduina	**Purpose:** Formation of knowledge, skills and abilities of using information technologies in educational activities. **Contents:** Features of construction of drives and actuators for robots, methods of control of actuators, fundamentals of design and analysis of manipulative									V				

				mechanisms and mechanisms of movement of robots in space, development of algorithms for controlling manipulative mechanisms and mechanisms of movement of robots.														
Personal computer software in education	PD	EC	Computer Methods of Approximate Calculation	**Purpose:** to form students' understanding of approximate methods of solving applied problems, methods of mathematical modeling, sources of errors and methods of accuracy of results. **Content:** Demonstrate the skills of applying numerical methods to solve practical problems using computers. -know the disciplines of the mathematical and natural science cycle; -apply in practice methods of mathematical analysis, theory of differential equations, probability theory and mathematical statistics.	5					V	V		V				
	PD	EC	Introduction to Computational Mathematics	**Purpose:** In connection with the emergence of new methods of theoretical research of complex processes that allow a mathematical description, a computational experiment, ie, the study of natural - scientific problems by means of computational mathematics, the role of the discipline "Introduction to Computational Mathematics" has significantly increased. **Contents:** Computational mathematics is defined in the broad sense of this term as a branch of mathematics, including a range of issues related to the use of computers, and in a narrow sense - as the theory of numerical methods and algorithms for solving mathematical problems It should be noted that a computational experiment is, as a rule, not a one-time calculation according to standard formulas, but, first of all, the calculation of a series of variants for various mathematical models.						V	V		V				
	BD	EC	Fundamentals of Multimedia Technologies in Adobe Flash	**Purpose:** The purpose of the subject "Fundamentals of multimedia technology" future computer science teachers should work with multimedia technologies when teaching computer science and in school informatization activities. **The content** is a means of pedagogical programs, electronic textbooks, to create Web designs, Web	5								V	V		V		

				sites, they must use animation, science, interactive multimedia, visual, pedagogical capabilities of Macromedi Flash programs. To create Flash movies in HTML format, should export any graphic editors on the internet.														
	BD	EC	Multimedia and Internet Technology	**Purpose:** Formation of students' scientific ideas about the essence and functions of modern multimedia systems and technologies, their place and role in the system of information systems and technologies, mastering practical skills of effective use of multimedia technologies in solving real practical problems **Contents:** The principle of operation of local and global computer networks, features of packet signal transmission, various types of communication channels and their impact on signal transmission, video processing and transmission technologies, format conversion are considered. Technologies for creating Internet projects using HTML5, JavaScript, etc., software for creating Internet applications are considered.									V	V			
	PD	EC	Digital Technologies in Education	**Purpose:** The ability to use modern digital technologies in education; **Contents:** Educational design. Components of the digital educational environment. Means, tools and digital technology transformations of education. E-learning is an educational process in which interactive electronic means of information delivery are used: CDs; corporate networks; Internet. Globally, it has become possible with the development of the Internet, which has given it the opportunity to communicate freely with other users of the network online and to post information on Internet sites.	4								V	V			
	PD	EC	E-Education	**Purpose:** The study of e-learning today is an educational process in which interactive electronic means of information delivery are used:compact discs; **Content:** corporate networks;Internet. Globally, this became possible with the development of the Internet, which made it possible to transfer the									V	V			

				necessary amount of data from one end of the world to the other, freely communicate with other network users in online mode and post information on Internet sites, making them accessible to everyone.														
	PD	EC	Modeling Applied Mathematics Tasks in MatCad	**Purpose:** to have an idea of the properties of the applied graphic and printed packages. Learning the basics of designing, building algorithms, three-dimensional graphic animations and applying mathematical calculations using the MathCad environment. Features of working with computer calculations, conducting modern computer calculations. **Contents:** entering computer computing between users: the emergence and development of the MathCad environment. MathCad workspace. MathCad environment calculator. Work with matrices in the MathCad environment. Two-dimensional arrays in the middle of MathCad. Creating a crossword puzzle in MathCad. Building 3D graphs in MathCad. Solving linear equations systems in MathCad. Solving differential equations in MathCad. Solving definite and indefinite integrals in MathCad. Solving mathematical analysis problems in MathCad. Special functions used in the MathCad environment. MathCad programming	4										V			
	PD	EC	Scientific Research in Computer Modeling and Information Technologies	**Purpose:** to form students' idea of approximate methods for solving applied problems, methods of mathematical modeling, sources of errors and methods of accuracy of results. **Contents:** approximate calculation. Absolute and relative error of numbers. Methods for approximating algebraic and transcendental equations. Methods for solving a system of linear equations. Exact methods for solving systems of linear equations. The approximation of certain integrals. The approximation of certain integrals. An approximate solution to simple differential equations. Conditions for the formulation of the Cauchy problem. Extreme problems for ordinary differential equations. Statement of accounting. Analytical methods for solving simple differential											V		V	

				equations: approximate methods for solving partial differential equations and integral equations.													
	PD	HsC	Industrial and Pedagogical Practice I	**Purpose:** Deepening theoretical knowledge in general scientific, cultural, psychological and pedagogical, methodological and basic and professional disciplines, as well as clarifying knowledge in disciplines in the course of practice, the formation of pedagogical skills and competencies. **Content:** Knowledge of all the main actions of the teacher and the class teacher in the system of integrity using the experience of teachers-methodologists; mastering the basics of work of students with parents; mastering the deep psychological and pedagogical methods of the individual in unity through the study and analysis of the educational situation, mastering the methods of analysis and introspection of various forms of educational work.	10			V							V	V	V
Module of Acquisition of New Professional Competencies	BD	EC	Subjects in the Additional Educational Program	**Purpose:** Additional educational program (Minor) -a set of disciplines and modules and other types of educational work, determined by the student to study in order to form additional competencies	12		V				V						V
Final Certification	PD	HsC	Pre-degree or Industrial Practice	**Purpose:** In the period of undergraduate practice, the following tasks: the student collects the actual material sufficient to perform the thesis, taking into account its specifics and topics; performs a certain individual task to practice a range of research theoretical and practical works, receiving advice from the head; writes a report of practice.	4											V	V	V
			Writing and Defendinig a Thesis, a Graduate Work, or Preparing and Passing a Comprehensive Exam	**Purpose:** Selection of research topics and planning of research work. Substantiation of the relevance of the chosen topic, definition, purpose and main objectives, object and subject of study. Formulation of the study hypothesis. Drawing up a schedule of work on the thesis. Selection and study of the main literary sources. Conducting experiments, processing their results, analysis. The expected results of the	8				V								V	V

				study. Writing, design and defense of the thesis.													
total					240кр.												

5. SUMMARY TABLE ON THE VOLUME OF LOANS DISBURSED IN THE CONTEXT OF EP MODULES

Year of study	Semester	Number of mastered modules	Number of disciplines studied			Number of credits KZ						Total hours	Total credits KZ	Number	
			CC	HsC	EC	Theoretical training	Physical education	Educational practice	Production practice	Teaching practice	Final certification			exam	offset
1	1	5	19	-	9	28	2					900	30	6	1
	2	4	15	-	12	27	2	1				900	30	4	3
2	3	6	4	16	7	27	2			1		900	30	6	3
	4	5	-	12	14	26	2			2		900	30	6	2
3	5	4	5	10	13	28				2		900	30	5	2
	6	4	-	-	26	26				4		900	30	5	1
4	7	5	-	4	29	33			10			1290	43	6	3
	8	2	-	-	-	-			4	5	8	510	17	1	2
total		**13**	**43**	**42**	**110**	**195**	**8**	**1**	**14**	**14**	**8**	**7200**	**240**	**39**	**17**

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: • using 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 EP

Educational Information Center	There are 6 subscriptions, 16 reading rooms, 2 electronic resource centers (ERC) in the structure of the EIC. The network infrastructure of the EIC is based on 180 computers with Internet access, 110 automated work places, 6 interactive whiteboards, 2 video doubles, 1 video conferencing system, 3 A-4, 3 format scanners. EIC software - AIBS "IRBIS-64" under MS Windows (basic set of 6 modules), stand-alone server for uninterrupted operation in the IRBIS system. The library fund is reflected in the electronic catalog available to users on the site http://lib.ukgu.kz on-line 24 hours 7 days a week. Thematic databases of their own generation have been created: "Almamater", "Proceedings of SKSU scientists", "Electronic archive". Online access from any device in 24/7 mode via an external link http://articles.ukgu.kz/ru/pps. Working with catalogs in electronic form. EC consists of 9 databases: "Books", "Articles", "Periodicals", "Proceedings of the teaching staff of SKSU", "Rare Books", "Electronic Fund", "SKGU in Print", "Readers", "SKR". The EIC provides its users with 3 options for accessing its own electronic information resources: from the “Electronic Catalog” terminals in the catalog hall and in the EIC subdivisions; through the information network of the university for faculties and departments; remotely on the library website http://lib.ukgu.kz/. Open access to international and republican resources: "SpringerLink", "Polpred", "Web of Science", "EBSCO", "Epigraph", to electronic versions of scientific journals in the public domain, "Zan", "RMEB", "Adebiet" , Digital library "Aknurpress", "Smart-kitap", "Kitap.kz", etc. For people with special needs and disabilities, the library website has been adapted to the work of visually impaired users.
Material and technical base	The material and technical base of the Department of Informatics includes the following classrooms and computer classes for undergraduate students: - there are 3 computer classes for laboratory work, one of them with an interactive whiteboard; - lecture halls; - STEM center. *Practice bases for students* 1. Shymkent, Gymnasium school No. 26 named after Zhambyl, Shymkent 2. Shymkent, SMCE "Higher College of New Technologies” named after Manap Utebayev" 3. Shymkent, secondary school No. 79 4. Shymkent, KazTilDamu LLP 5. Shymkent, South Kazakhstan Humanitarian and Economic College 6. Shymkent, specialized boarding school No. 2 with instruction in three languages 7. Shymkent, Lyceum school No. 15 named after D.I.Mendeleev

F.7.02-09

APPROVAL SHEET

under the Educational program "6B01531 – Mathematics-Computer science"

DAA Director _____ Naukenova A.S.

Director of DAN _____ Nazarbek U.B.

Director of DPI K _____ Bazhirov T.S.