Ф.7.02-10

MINISTRY OF SCIENCEs AND higher EDUCATION

OF THE REPUBLIC OF KAZAKHSTAN

M.AUEZOV SOUTH KAZAKHSTAN UNIVERSITY

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| «APPROVED»  Acting Chairman of the Board-Rector \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ K.Nurmanbetov  «\_\_\_\_»\_\_\_\_\_\_2024y. |

**EDUCATIONAL PROGRAM**

**6В07320- Civil Engineering**

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| Registration number | 6В07300015 |
| Code and Classification of Education | 6В07 "Engineering, manufacturing and сivil Engineering " |
| Code and Classification of Areas of Training | 6В073 «Architecture and Civil Engineering» |
| Group of educational programs (EP) | В074 – “Urban planning, construction work and civil engineering” |
| Type of EP | Аctive |
| ISCE level | 6 |
| NQR 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, 2024

Developers:

|  |  |  |
| --- | --- | --- |
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The EP was considered at a meeting of the Academic Quality Committee of the «Architecture, Construction and Transport» faculty, Minutes # \_\_\_ «\_\_\_\_\_» \_\_\_\_\_\_ 2024y.

Chairman of the Committee \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ E. Kalshabekova

The EP was considered and recommended for approval at Educational-methodical meeting of M. Auezov SKU Minutes # \_\_\_\_ «\_\_\_\_\_» \_\_\_\_\_\_\_\_\_\_2024y.

Chairman of the EMM \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ K. Sarykulov

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

Minutes # \_\_\_\_ «\_\_\_\_\_» \_\_\_\_\_\_\_\_\_\_2024y.

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1. **Concept of the program**

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| **Mission of the University** | We are focused on generating new competencies, training a leader who translates research thinking and culture. |
| **University Values** | * Openness - open to change, innovation and cooperation. * Creativity - generates ideas, develops them and turns them into values * Academic freedom - free to choose, develop and act. * Partnership - creates trust and support in a relationship where everyone wins. * 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 * Research skills, creativity and emotional intelligence * Entrepreneurship, independence and responsibility for their activities and well-being * Global and national citizenship, tolerance to cultures and languages |
| **Uniqueness of the EP** | The uniqueness of the educational program "6B07320 - Civil Engineering" is the training of highly qualified specialists in the field of construction, taking into account regional peculiarities that affect engineering decisions in the design and construction of industrial and civil facilities, and taking into account the requirements of employers. |
| **Academic Integrity and Ethics Policy** | The university has taken measures to maintain academic integrity and academic freedom, protection from any type of intolerance and discrimination:  • Rules of academic integrity (order No. 212 of October 10, 2022);  • Anti-corruption standard (order No. 221 n/a dated 12/07/2021).  • Code of Ethics (Order No. 212 of October 10, 2022) |
| **Regulatory and legal framework for the development of EP** | 1.Law of the Republic of Kazakhstan “On Education”;  2. Model rules for the activities of educational organizations implementing educational programs of higher and (or) postgraduate education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated October 30, 2018 No. 595 with amendments and additions dated December 29, 2021. No. 614  3. Standard rules for admission to training in educational organizations implementing educational programs of higher and postgraduate education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated October 31, 2018 No. 600 with amendments and additions dated 06/02/2023. No. 252  4. State mandatory standards for higher and postgraduate education, approved by order of the Ministry of Education and Science of July 20, 2022 No. 2;  5. Rules for organizing the educational process in credit technology of education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated April 20, 2011 No. 152; with changes and additions from 09/23/2022. No. 79  6. Qualification reference book for positions of managers, specialists and other employees, approved by order of the Minister of Labor and Social Protection of the Population of the Republic of Kazakhstan dated December 30, 2020 No. 553.  7. Methodological recommendations for introducing ECTS principles into the educational process and expanding academic freedom. Appendix to the order of the Minister of Science and Higher Education. of the Republic of Kazakhstan dated February 12, 2024 No. 57  8. Guidelines for the development of educational programs for higher and postgraduate education, Appendix 1 to the order of the Director of the National Center for the Development of Higher Education of the Ministry of Education and Science of the Republic of Kazakhstan dated May 4, 2023 No. 601 n/k |
| **Organization of the educational process** | * Implementation of the principles of the Bologna Process * Student-centered learning * Availability * Inclusivity |
| **Quality assurance of EP** | * Internal quality assurance system * Involvement of stakeholders in the development of the EP and its evaluation * Systematic monitoring * Updating the content (updating) |
| **Requirements for applicants** | They are established in accordance with 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 October 31, 2018, with changes and additions dated June 2, 2023. No. 252 |
| **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 program**

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| **Purpose of the EP** | Training of specialists with theoretical and practical knowledge in the field of design and construction of buildings and structures, with a broad outlook and a culture of thinking. |
| **Tasks of the EP** | • formation of socially responsible behavior in society, understanding the importance of professional ethical standards and following these standards;  • providing lifelong learning skills and abilities that will enable them to successfully adapt to changing conditions throughout their professional career;  • 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 labor in the field of construction design and construction production;  • formation of competitiveness of graduates in the field of construction, to ensure the possibility of their fastest possible employment in the specialty or continuing their studies in the master's degree.   * creating conditions for the formation of in-demand knowledge and skills, an informed attitude to improving the well-being of the population and protecting the planet in the context of the Sustainable Development Goal. |
| **Harmonization of EP** | **•** 6 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** | "Construction of residential and non-residential buildings", "Installation and installation of prefabricated and monolithic сonstruction", "Development of construction projects" (approved by order of the Acting Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken") dated 07/28/2023 No. 122 Appendices No. 10, 14, 18.  Professional standard "Forensic construction expertise" Appendix 24 (Order of the Minister of Justice of the Republic of Kazakhstan dated January 23, 2024 No. 60). |
| **Name of the degree awarded** | After successful completion of this educational program, the graduate is awarded the degree: "Bachelor of Engineering and Technology in the educational program 6B07320- Civil Engineering" |
| **List of qualifications and positions** | Design Engineer; civil engineer; quality engineer; construction supervision engineer; labor rationing engineer; labor organization engineer; production management engineer; labor protection and safety engineer; design technician; laboratory technician; labor technician; process technician, forensic expert. |
| **Field of professional activity** | • Construction, urban economy and construction facilities of mechanical engineering, chemical, mining, oil, gas, and metallurgical industries. |
| **Objects of professional activity** | • Construction and installation departments and organizations; design and scientific institutes; factories for the production of construction products; utilities; enterprises for the operation and repair of construction machinery and equipment; joint-stock construction associations. |
| **Subjects of professional activity** | • Development of space-planning and structural solutions of buildings and structures for various purposes; justification of engineering equipment and master plan based on knowledge of regulatory documents of the Republic of Kazakhstan and Eurocodes; development of projects for the production of general construction works and projects; organization of construction of buildings and structures. |
| **Types of professional activity** | • Perform design work on the design, construction and reconstruction of buildings and structures, engineering systems of buildings and structures for industrial and civil purposes;  • Participate in the implementation of research and conduct scientific and pedagogical activities in educational organizations. |
| **Learning outcomes** | **LО1.** Communicate in the field of construction production and society in Kazakh, Russian and English, taking into account the principles of academic writing and the culture of academic honesty.  **LО2.** Demonstrate social, legal, social knowledge for the formation of ideological and civic positions, as well as methods of scientific research.  **LО3.** To use the basics of mathematical, economic, natural science, entrepreneurial knowledge, management and competent allocation of finances, as well as methods of engineering sciences in solving professional problems in the field of construction.  **LО4.** Apply modern technology and information technologies in the development of space-planning and structural solutions of buildings and structures and the performance of thermal calculations of enclosing structures.  **LО5.** Perform calculations of building structures taking into account seismic, explosive and other impacts with the adoption of competent decisions when assigning design elements of buildings and structures.  **LО6.** Perform calculations of the need for building materials, structures, construction equipment and mechanisms, evaluate critical technical and economic indicators of construction objects.  **LО7.** To determine the physico-mechanical properties of building materials, soils of foundation bases, to evaluate their quality and design characteristics, to make competent decisions on the choice of types of foundations, taking into account the geological conditions of the foundation.  **LО8.** Apply modern specialized computer-aided design systems for the design of construction objects, as well as individual structural elements of buildings.  **LО9.** Apply the global trends of "green construction" taking into account the requirements for regulation and improvement of energy efficiency of buildings and structures in the design and construction.  **LО10.** Apply at a professional level the main provisions of regulations, building codes and technical conditions governing construction activities in the field of technology and organization of construction production.  **LО11.** Carry out work on monitoring and assessing the condition of buildings and structures during operation, including with the help of instrumental observations.  **LО12.** Develop occupational health and safety measures in the field of construction, taking into account the requirements of regulatory documents. |

**3. Competencies of an EP graduate**

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| **GENERAL COMPETENCIES** (SOFTSKILLS). Behavioral skills and personal qualities | |
| GC 1. Competence in managing one's literacy | CC 1.1. The ability to self-study, self-develop and constantly update their knowledge within the chosen trajectory and in an interdisciplinary environment.  CC 1.2. The ability to express thoughts, feelings, facts and opinions in the professional sphere.  CC 1.3. The ability to mobility in the modern world and critical thinking. |
| GC 2. Language competence | CC 2.1. Ability to build communication programs in the state, Russian and foreign languages.  CC 2.2. The ability to interpersonal social and professional communication in the conditions of intercultural communication. |
| GC 3. Mathematical competence and competence in the field of science | CC 3.1. 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. |
| GC 4. Digital competence, technological literacy | CC 4.1. The ability to demonstrate and develop information literacy through the mastery and use of modern information and communication technologies in all spheres of your life and professional activity.  CC 4.2. The ability to use various types of information and communication technologies: Internet resources, cloud and mobile services for the search, storage, protection and dissemination of information. |
| GC 5. Personal, social and educational competencies | CC 5.1. The ability to physical self-improvement and orientation to a healthy life to ensure full-fledged social and professional activities through methods and means of physical culture.  CC 5.2. The ability to socio-cultural development based on the manifestation of citizenship and morality.  CC 5.3 The ability to build a personal educational trajectory throughout life for self-development, career growth and professional success.  CC 5.4. The ability to successfully interact in a variety of socio-cultural contexts during study, at work, at home and at leisure. |
| CC 6. Entrepreneurial competence | CC 6.1. The ability to be creative and enterprising in different environments.  CC 6.2. The ability to work in the determination and rapid change of task conditions, make decisions, allocate resources and manage your time.  CC 6.3. Ability to work with consumer requests. |
| CC 7. Cultural awareness and self-expression | CC 7.1. The ability to show ideological, civic and moral positions.  CC 7.2. The ability to be tolerant of the traditions and culture of other peoples of the world, to possess high spiritual qualities. |
| **PROFESSIONAL COMPETENCIES** (HARDSKILLS). | |
| Theoretical knowledge and practical skills specific to this field | PC1. The ability to independently acquire new knowledge in professional activities using modern educational and information technologies, to study and analyze domestic and foreign scientific and technical information in the field of construction |
| PC2. Have the skills to collect initial data, identify design schemes and perform static calculations of complex systems and design elements of buildings and structures, be able to protect the design decisions of construction projects in expert organizations of various levels. |
| PC3. Possess the skills to develop projects for the production of works, to carry out management during the production of construction works and quality control, to lead a team of construction workers, to possess the skills to control the quality of construction works and the implementation of remuneration, to monitor safety during the production of construction works. |
| PC4. Have the skills to develop construction organization projects, the ability to organize a construction site for construction objects, develop and control construction schedules, schedules for the supply of building structures and materials, schedules for the movement of labor and construction machinery and mechanisms. |
| PC 5. Possess the skills to assess the condition of buildings and structures in terms of their operational qualities, the ability to make decisions to eliminate the detected defects in structural elements of buildings and structures, to carry out current and major repairs of structural elements of buildings and structures. |

**3.1 Matrix of correlation of learning outcomes in the EP as a whole with the competencies being developed**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | LО1 | LО2 | LО3 | LО4 | LО5 | LО6 | LО7 | LО8 | LО9 | LО10 | LО11 | LО12 |
| CC 1 | + |  |  | + |  |  |  |  | + |  | + |  |
| CC 2 | + |  |  |  | + |  |  |  |  | + |  |  |
| CC 3 |  | + |  |  |  | + | + | + |  | + | + | + |
| CC 4 |  |  | + | + |  |  |  |  | + | + | + | + |
| CC 5 | + | + | + |  |  | + |  |  |  |  | + | + |
| CC 6 |  | + |  |  |  | + |  |  |  |  | + | + |
| CC 7 | + | + |  | + |  | + | + |  |  |  |  |  |
| PC 1 | + | + | + | + | + | + | + | + | + | + | + | + |
| PC 2 | + |  | + | + | + | + | + | + | + | + | + | + |
| PC 3 | + |  |  |  |  | + |  |  |  | + | + | + |
| PC 4 | + |  |  |  |  |  |  |  |  | + | + | + |
| PC 5 | + |  |  |  |  |  |  |  |  |  | + |  |

**4. Matrix of the influence of modules and disciplines on the formation of learning outcomes and information on labor intensity**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **№** | **Module** | **Cycle** | **Component** | **Name of the discipline** | **Brief description of the discipline** | Quanty loans | **Generated learning outcomes (codes)** | | | | | | | | | | | |
| LО 1 | LО 2 | LО3 | LО4 | LО5 | LО6 | LО7 | LО8 | LО9 | LО10 | LО 11 | LО12 |
| 1 | Fundamentals of the Public Sciences | GED | OC | History of Kazakhstan | **Purpose:** 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.  **Content:** 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 |  |  |  |  |  |  |  |  |  |  |
| 2 | GED | OC | Philosophy | **Purpose:** Formation of critical thinking of a student through teaching philosophical and logical methods, ability to analyze social phenomena, state values.  **Content:** Culture of thinking and history of philosophical thinking. Ancient, medieval and newest philosophy. Worldview and its views. Being and cognition. Dialectical analysis methods. Cognition and creative thinking. Anthropological philosophy. Existential philosophy. Ethics and aesthetics. Art and creative thinking. Society and culture. Cycles of society development. Philosophy of engineering and natural science. Philosophy of history. Modern Kazakh society and its spiritual renewal. | 5 |  | v |  |  |  |  |  |  |  |  |  |  |
| 3 | Socio-Political knowledges | GED | OC | Social and Political Studies | **Purpose:** Formation of knowledge about socio-political activity, explanation of socio-political processes and phenomena.  **Content:** Consideration of social and ethical values of societies. Understanding the peculiarities of social, political, cultural, psychological institutions in the context of their role in the modernization of Kazakh society. Making decisions to resolve conflict situations in society, including in professional society. Research of political institutions and processes, 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 |  | v |  |  |  |  |  |  |  |  |  |  |
| 4 | GED | OC | Cultural Studies and Psychology | **Purpose:** 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 |  |  |  |  |  |  |  |  |  |  |
| 5 | Socio-ethnic Development | GED | HsC | Ecosystem and Law | **Purpose:** Formation of integrated knowledge in the field of economics, law, anti-corruption culture, ecology and life safety, entrepreneurship, methods of scientific research.  **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 law, obligations and guarantees of subjects, state regulation of public relations to ensure social progress. Application of scientific research methods. | 5 |  | v |  |  |  |  |  |  |  |  |  |  |
| 6 | BD | EC | Basics of financial literacy | **Purpose:** exploring personal and family financial resources that are crucial to achieving financial well-being.  **Contents:** Financial planning and consumer safety. Basic methods and techniques for effective spending and saving money. Protecting and investing your own financial resources. The role and significance of personal finance, its capabilities for achieving financial stability. Filtering out a lot of dubious financial information. Incentives for independent management of responsibilities and optimal financial capabilities of the consumer. Making smart financial decisions when building a professional career. | 3 |  | v |  |  |  |  |  |  |  |  |  |  |
| 7 | BD | EC | Mukhtar Studies | **Purpose:** To form a historical, literary idea of M. Auezov's work in the context of literary history, patriotism and cultural and spiritual position. Development of artistic thinking, skills of independent research activity.  **Contents:** 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 |  |  |  |  |  |  |  |  |  |  |
| 8 | BD | EC | Abai Studies | **Purpose:** Preservation of the "national code" in the project "Kazakhtanu" based on the creativity of A.Kunanbayev.  **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, 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. Tokaev "Abai and Kazakhstan in the XXI century", role, significance. |  | v |  |  |  |  |  |  |  |  |  |  |
| 9 |  | EC | Basics of anti-corruption 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 conscious perception, attitude to corruption. Moral rejection of corrupt behavior, corrupt morality, ethics. Mastering the skills necessary to counter corruption. Creating an anti-corruption standard of conduct. Anti-corruption propaganda, dissemination of ideas of legality, respect for the law. Activities aimed at understanding the nature of corruption, awareness of social losses from its manifestations, the ability to defend one's position in a reasoned manner, to look for ways to overcome manifestations of corruption. |  |  |  | v |  |  |  |  |  |  |  |  |  |
| 10 |  | EC | Service of Society | **Purpose:** Formation of socially significant skills and competencies based on the assimilation of academic programs, carrying out socially useful activities related to the disciplines studied at the university.  **Content:** 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 |  |  |  |  |  |  |  |  |  |  |
| 11 | Communication and Physical Training Module | GED | OC | Kazakh (Russian) Language | **Purpose:** formation of communicative competence using the Kazakh (Russian) language in the socio-cultural, professional sphere and public life, improvement of the ability to write academic texts.  **Content:** Levels A1, A2, B1, B2-1, B2-2 (B2, C1 Russian) are presented in the form of cognitive- linguistic-cultural complexes consisting of spheres, topics, subtemes and typical communication situations of international standard: social, social, 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 |  |  |  |  |  |  |  |  |  |  |  |
| 12 | GED | OC | Foreign Language | **Purpose:** the formation of intercultural and communicative competence in the process of foreign language education at a sufficient level A2 and the level of basic sufficiency B1. The student reaches the B2 level of the pan-European competence if there is a language level at the start above the B1 level 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 the development of critical thinking. | 10 | v |  |  |  |  |  |  |  |  |  |  |  |
| 13 | GED | OC | Physical Training | **Purpose:** formation of social and personal competencies and the ability to purposefully use the means and methods of physical culture that ensure the preservation and strengthening of health for preparation for professional activity; for 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. | 8 | v |  |  |  |  |  |  |  |  |  |  |  |
| 14 | BD | HsC | Professional Kazakh (Russian) Language | **Purpose:** development of the student's communicative competence for the implementation of professional speech activity.  **Contents:** The concept of "professional Russian language and professional culture of speech" and the scope of its use, Functional types of professional speech, Norms in professional speech, Professional vocabulary and professional jargon, Terminological system of the Russian language, Problem translation of terms. Word-building elements of terminological vocabulary, Norm in Terminology, International Terminology, Special Text, Main Genres of Scientific and Professional Texts: Abstract, Abstract, Review, Culture of Speech and Peculiarities of Speech Behavior in the Professional Sphere, Richness and Expressiveness of Speech, Professional ethics and etiquette of speech behavior. | 3 | v |  |  |  |  |  |  |  |  |  |  |  |
| 15 | BD | HsC | Professionally Oriented Foreign Language | **Purpose:** formation of students' professional communicative competencies within the framework of the chosen educational program, business and interpersonal communication.  **Content:** Vocabulary of the professional language. Terms. Working with text. History of civil engineering. Building site. Construction works. Control of quality of Construction work. Some building professions. Geotechnique. Types of construction equipment. Some building materials. Safety technique on a building site. Technology of masonry. Technology of concrete and ferro concrete design. Finishing works. Construction design. Metal construction. Economy and management in construction | 3 | v |  |  |  |  |  |  |  |  |  |  |  |
| 16 | GED | OC | Information and Communication Technologies | **Purpose:** formation of the ability to critically evaluate and analyze processes, methods of searching, storing and processing information, methods of collecting and transmitting information through digital technologies. Development of new "digital" thinking, acquisition of knowledge and skills of using modern information and communication technologies in various activities.  **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. | 5 |  |  | v |  |  |  |  |  |  |  |  |  |
| 17 | Engineering Training | BD | EC | Descriptive Geometry and Engineering Graphics | **Purpose:** To develop spatial representation and imagination, constructive geometric thinking, the ability to analyze and synthesize spatial forms and relationships based on drawings of specific objects.  **Content:** Basic rules for drawing drawings. Rules for drawing dimensions in drawings. Methods of projection. Orthogonal projections. Projections of a point, a straight line and a curved line. An image of a plane in a complex drawing. Methods of defining the surface. Positional tasks. Metric tasks. The image of objects in drawings: views, sections, sections. Axonometric projections. Perspective projections. Image of the connections of the parts. Working drawings of parts. Application of material designations on working drawings. Execution of a general view drawing. Assembly drawing. Features of execution of construction drawings. | 3 |  | v |  |  |  |  |  |  |  |  |  |  |
| 18 | BD | EC | Basics of Academic Writing | **Purpose:** To familiarize students with the main features of the scientific style of speech. Formation of skills for creating written and oral academic texts based on the idea of their goals, structure, stylistic features, genre differences. Mastering the basic principles of communication in an academic environment.  **Content:** The concept of academic writing. Academic writing as a procedural formalization of the process of scientific communication. The concept of an academic text. Functions of academic texts: descriptive, persuasive, constructive. Types of academic texts. Socio-cultural features of writing academic texts in the English and Russian-speaking traditions. Requirements for academic texts and language for checking text documents for the presence of borrowings from open sources. | v |  |  |  |  |  |  |  |  |  |  |  |
| 19 | BD | HsC | Engineering and Computer Graphics | **Рurpose:** Formation knowledge, skills and abilities sufficient to compile engineering and design documentation using AutoCAD.  **Content:** Projection. Point and straight line. Plane. Axonometric projections. Geometric surfaces and bodies. Basic information on graphic design of drawings. Views, cuts and sections in drawings. Methods of connecting parts. Threaded products. Making sketches of parts. Compilation and design, reading and detailing of assembly drawings and general drawings. Initial setup. Completion and saving images. Building a drawing of a flat figure. Building a drawings of parts. Image Editing. Building a three-dimensional model of an object. | 4 |  |  | ѵ |  |  |  |  |  |  |  |  |  |
| 20 | BD | HsC | Engineering Mechanical | **Purpose:** Formation of knowledge in the field of strength, rigidity and stability of structures.  **Contents:** The main provisions of statics, the concept of the vector of forces, the projection of forces on the axis, the moment of a pair of forces. Differential equation the main problems of dynamics. The main hypotheses and assumptions of the resistance of materials are axial tension and compression, transverse bending, shear, complex types of deformations, stress-strain state, stability of compressed structural elements and structures. | 4 |  |  | ѵ |  |  |  |  |  |  |  |  |  |
| 21 | BD | EC | Structural Mechanics | **Purpose:** Formation of students' theoretical knowledge about the forces and conditions of equilibrium. **Content:** The basic concepts of the theory of elasticity and plasticity. Equilibrium conditions. Equilibrium on the plane. The axiom of connections. Types of bonds and their reactions. Shift. Bend. Stability. The method of forces. The Mohr integral. Concepts of the basic system. The method of movement. Tabular plots of moments. Reactive moments and reactive forces. The finite element method. Implementation of the FEM on a computer. | 5 |  |  | ѵ |  | ѵ |  |  |  |  |  |  |  |
| 22 | BD | EC | Technical Mechanics | **Purpose:**  Formation of students' knowledge for calculating machine parts.  **Contents:** Concepts of force, types of forces, conditions and equations of equilibrium; Laws of mechanical motion, velocity, acceleration, trajectory of motion and fundamentals of solid dynamics. General principles of calculations for strength, rigidity and stability, as well as theoretical and experimental study of the stress-strain state of bodies. Mechanical gears - gear, worm, friction, belt and chain gears. Shafts, axles, bearings and couplings. General characteristics and calculation of connecting parts. |  |  | ѵ |  |  |  |  |  |  |  |  |  |
| 23 | BD | HsC | Standardization, Certification and Metrology | **Purpose:** formation of theoretical knowledge and practical skills in the field of standardization, certification and metrology to solve problems of ensuring the uniformity of measurements and quality control of products, services and works in their professional activities.  **Content:** Objects of standardization, certification and metrology. Legislative and regulatory-technical base of standardization systems, technical regulation, metrology and conformity assessment. General scientific and special methods of standardization. Certification and declaration schemes. Methods and types of measurements. Calculation of measurement errors and uncertainties. The technical basis of metrology. The role of international management systems in improving the competitiveness of enterprises. | 4 |  |  | ѵ |  |  |  |  |  |  | ѵ |  |  |
| 24 | BD | EC | Geodesy | **Purpose:** Formation of comprehensive theoretical knowledge and practical skills in performing geodetic works during surveys, design, construction, operation of various engineering structures.  **Contents:** The shape and size of the earth. Geodetic measurements, types of surveys, their classification, methods of performing geodetic works in construction. The device of geodetic instruments used for angular and linear measurements. Methods of surveys, construction of engineering and geodetic networks, center work, methods of monitoring deformations of structures. Work with geodetic instruments in solving engineering and geodetic tasks. Theodolite survey, the construction of a route profile, the removal of building axes to the terrain and other tasks. | 4 |  |  | ѵ |  |  |  |  |  |  |  | ѵ |  |
| 25 | BD | EC | Introduction to Speciality | **Purpose:** Familiarization with the future specialty, with the prospects and development of civil and industrial construction. Formation of fundamental knowledge of the history and main stages of development of theory and practice of architectural and construction business in the Republic of Kazakhstan  **Contents:**  Information about construction, architecture and housing and communal services. The construction complex of the Republic of Kazakhstan, construction enterprises and their organizational and legal forms. Participants in the construction process, design and estimate work, a system of regulatory documents. The history of the development of the construction business. The state of the construction industry and its development prospects | ѵ |  |  |  |  |  |  |  |  |  |  |  |
| 26 | BD |  | Educational Practice | **Purpose:**  Acquisition of practical skills and experience in conducting geodetic measurements on a construction site, as well as in working with tools and technologies used in geodesy.  **Content:**To master practical skills of working with geodetic equipment and the use of geodetic methods and technologies to solve problems related to the construction of facilities. Collection and processing of geodetic data, creation of geodetic plans and project documentation. Comprehensive consolidation of previously studied material and the acquisition of practical skills in field work on the ground. | 1 |  |  | ѵ |  |  |  |  |  |  |  |  |  |
| 27 | BD | EC | Modern Computer Technologies in Designing | **Purpose:** Application of modern computer technology in the design of construction projects.  **Content**: Design of buildings and structures of various structural schemes using modern computer programs. Creating a physical model of the building. Assignment of building construction materials. Creation and editing of load-bearing and non-load-bearing structures of buildings. Working with views. Development of plans, sections, facades of buildings. Drawing dimensional lines. Execution of inscriptions in working drawings of structures. Preparation of project documentation, preparation of working drawings and specifications. | 4 |  |  |  | ѵ | ѵ |  |  | ѵ |  |  |  |  |
| 28 | BD | EC | Educational and Research Work of Students | **Purpose:**  The formation of skills for independent research, the development of critical thinking, the ability to apply scientific research methods for in-depth study of scientific topics and problems.  **Content:** Fundamentals of scientific research. Formulation of a scientific problem and formulation of a hypothesis. Planning and organization of the study. Choosing a research topic. Collection and analysis of literature. Preparation of a scientific paper. The design and structure of scientific work. Writing an introduction, theoretical and practical parts. Conducting a study. Scientific communication. Publication of scientific articles. Participation in conferences and seminars. Carrying out project work within the framework of the chosen research topic. Academic ethics and integrity. |  |  | ѵ |  |  |  |  |  |  |  |  |  |
| 29 | Mathematical and Natural-Science Fundamentals | BD | HsC | Mathematics | **Purpose:** perform the necessary measurements and related calculations, calculate the area and volume of parts of building structures, the volume of earthworks, apply mathematical methods to solve professional problems.  **Content:** Determinants. Matrix. Methods for solving systems of linear equations. Vectors. Various equations of a straight line and a plane in space. Curves and surfaces of the second order. Subsequence. Function. Limits of sequences and functions. Complex numbers. Function derivative. Derivatives of higher orders. Indefinite and definite integrals. Multiple integrals of the I-th and II-th kind. | 5 |  |  | ѵ |  |  |  |  |  |  |  |  |  |
| 30 | BD | HsC | Physics | **Purpose:** Formation of knowledge of physical laws and skills of their application in engineering and production technology, development of skills for conducting and evaluating the results of theoretical and experimental research, development of scientific thinking based on an interdisciplinary approach.  **Contents:** The laws of classical and modern physics (mechanics, molecular physics, thermodynamics, electromagnetism, optics, quantum and atomic physics). The application of knowledge of physical phenomena and processes to solve applied, technical and technological problems based on an interdisciplinary approach. Scientific research methods, methods of planning, conducting, processing and analyzing the results of theoretical and experimental research. | 6 |  |  | ѵ |  |  |  |  |  |  |  |  |  |
| 31 | BD | EC | Chemistry | **Purpose:** Formation by students of knowledge about the structure and properties of substances, theoretical foundations and general patterns of the flow of chemical and electrochemical reactions.  **Content:** Atomic and molecular weights. Basic concepts and laws of chemistry. The structure of the atom. Main classes and nomenclature of inorganic substances. Oxides, acids. salts, bases. The concept of equivalence. Equivalent law Chemical bonds. Covalent polar and non-polar bond. Solutions. The concentration of solutions. Properties of solutions. Chemical kinetics. Chemical equilibrium. A factor that affects the rate of a chemical reaction. Сomplex compounds. Redox reactions and electrochemical processes. Salt hydrolysis. | 4 |  |  | ѵ |  |  |  |  |  |  |  |  |  |
| 32 | BD | EC | Chemistry of Building Materials | **Purpose:** Formation of a competent and conscious ability to select and use building materials based on an understanding of the chemical nature of the processes occurring during their production, structure formation and operation.  **Content:** Physico-chemical foundations of materials science. Fundamentals of thermodynamics and kinetics of building materials Properties of water and its role in construction. Physical and chemical bases of hardening of binders, concretes and mortars. Corrosion of natural and artificial stone, metal building materials and structures. Chemical additives in concretes and mortars. Physical and chemical methods of analysis of building materials. Chemistry of organic building materials. Polymers in construction |  |  | ѵ |  |  |  |  |  |  |  |  |  |
| 33 | Engineering and Сonstruction Design | BD | EC | Construction Materials | **Purpose:** Formation of knowledge of the basics of technology for the production of building materials, practical skills in determining the basic properties of materials.  **Content:** The main properties of building materials. The nomenclature and purpose of building materials. A set of factors affecting the basic properties and structure of materials. The raw material base for the production of building materials is rocks and minerals. Natural stone materials. Mineral binders. Ceramic materials and products. Materials and products made of mineral melts. Concretes and mortars. Reinforced concrete products. Forest materials. Thermal insulation and acoustic materials. Metal materials and products. Organic materials. | 4 |  |  |  |  |  |  | ѵ |  |  |  |  |  |
| 34 | BD | EC | Construction Materials Science | **Purpose:** Formation of theoretical knowledge and practical skills in the field of structure formation of materials for the competent selection and operation of materials in construction.  **Contents**: The stages of formation and development of building materials science. Contribution to the development of materials science by M.V. Lomonosov and D.I. Mendeleev. Theoretical and practical issues of building materials science in their interrelation: nomenclature, composition, structure, properties. The law of the target. The basic principles of technological processes for the production of building materials for various purposes. Criteria for the progressiveness of building materials technology Modern data on the structure formation of materials, the creation of artificial building conglomerates. The role of materials science in expanding and improving the nomenclature of materials. |  |  |  |  |  |  | ѵ |  |  |  |  |  |
| 35 | BD | EC | Basics of Building Design | **Purpose**: To study the trends of modern urban planning and architecture by students, to gain knowledge about the basic principles of designing buildings and structures, the main spatial planning schemes of buildings, the basics of building design.  **Content:** Fundamentals of design of building structures. Design of low-rise residential buildings. The influence of natural and climatic factors on the planning and development of urban areas. The use of various buildings in accordance with their space-planning schemes and functional purpose. | 6 |  |  |  | ѵ |  |  |  | ѵ |  |  |  |  |
| 36 | BD | EC | Virtual Design | **Purpose:** Learning the basics of virtual design of buildings and structures.  **Content:** Creation of information models of industrial and civil construction facilities. Creation of master plans. Creation of architectural models of a building using modern computer programs. Creating drawings and specifications. Creating models of building engineering networks using the Revit MEP PC. Preparation of estimated documentation for the construction site. Creation of construction schedules using a software package. The relationship of the building model with the construction schedule and the cost of work when designing using the Revit PC. |  |  |  | ѵ |  |  |  | ѵ |  |  |  |  |
| 37 | BD | EC | Design of Buildings and Structures | **Purpose**: Formation of skills in the basics of designing buildings for various purposes in accordance with their functional purpose.  **Content**: Requirements for the procedure for the development, coordination, approval and composition of design estimates for civil and industrial construction facilities; provisions and requirements for State and non-departmental expertise of projects; design features of spatial planning and structural solutions for residential, public and industrial buildings and structures, and their general plans; provisions for ensuring the reliability of building structures; frames single-storey buildings; materials; foundations and foundation beams | 4 |  |  |  | ѵ |  |  |  | ѵ |  |  |  |  |
| 38 | BD | EC | Engineering Preparation and Landscaping | **Purpose:** The study of the basics of engineering infrastructure, a system of knowledge about the engineering support of objects of various purposes, structures and sizes.  **Content:** Theoretical foundations of modern development and improvement of urban areas, taking into account nature protection and rational use of natural resources, energy conservation issues. Issues of feasibility study of options for protecting territories from flooding by surface and groundwater. Engineering preparation of the territory of the construction site. The design of the territory taking into account the drainage of water, the design of streets, intersections, the selection of small architectural forms. Elements of landscaping of the construction site. |  |  |  | ѵ |  |  |  |  | ѵ |  |  |  |
| 39 | PD |  | Production practice І | **Purpose:** Consolidation and deepening of theoretical knowledge, in the process of studying at the university of the disciplines "Fundamentals of building design", "Design of buildings and structures", acquisition of necessary labor skills at construction sites.  **Content:** Familiarization with the structures and activities of enterprises. Participation in certain types of construction work on construction sites as a foreman, foreman, study and compliance with safety, labor protection and fire safety regulations, labor organization, team composition and distribution of responsibilities among workers. Measures are being developed to increase labor productivity. | 5 |  |  |  | ѵ |  |  |  |  |  |  |  |  |
| 40 | BD | EC | Basics of Design of Building Constructions | **Purpose:** Training in the basics of building design, taking into account the requirements of Eurocodes.  **Contents:** Classification of building structures, areas of application and classification of Eurocodes. The difference between the Principles and Rules of application of Eurocodes. Basic variables. Design principles for limit states: design situations; critical limit states; limit states for operational suitability. Classification of impacts, characteristic and other representative values of variable impacts. Partial coefficients for impacts. The characteristic and calculated values of the resistance of materials. Partial coefficients for materials. Combinations of effects for permanent, transient, emergency and seismic design situations. | 4 |  |  |  |  | ѵ |  |  |  |  |  |  |  |
| 41 | BD | EC | Probabilistic methods for calculating building structures | **Purpose:**  Teaching the basics of building reliability design using probability theory  **Contents:** Fundamentals of probability theory: random variables, functions of random variables, random processes, mathematical models of random processes. characteristics of random parameters, description of the properties of building materials with a certain security, assessment of the normative values of impacts from the point of view of probability theory. Laws of distribution of random variables. Application of a probabilistic approach to the problems of reliability of the structure. |  |  |  |  | ѵ |  |  |  |  |  |  |  |
| 42 | BD | EC | Engineering Systems of Buildings and Structures | **Purpose:** to obtain theoretical knowledge and practical skills in the design and calculation of engineering systems of buildings and structures.  **Contents:** Water supply systems and schemes of residential areas of cities and settlements. Outdoor water supply network, tracing, construction, schematics. Systems and schemes of internal water supply of buildings, network equipment, calculation. Sewerage systems of buildings, design and calculation. The device of the sewer network of settlements, the longitudinal profile of the network. Water supply and sewage treatment plants. Centralized heat supply, heat carriers, heating networks. Heating of buildings, elements, schemes. Ventilation and air conditioning of buildings. Gas supply of buildings, city gas networks. | 5 |  |  |  |  |  |  |  |  | ѵ |  |  |  |
| 43 | BD | EC | Heating and Ventilation | **Purpose:** obtaining theoretical knowledge and practical skills in the design and calculation of heating and ventilation systems of buildings and structures  **Contents:** Centralized heat supply of populated areas, heat carriers, basic elements. Heating networks, classification, laying. Requirements for heating installations. Various heating systems, classification, advantages and disadvantages, scope of application, methods of air release, schemes, equipment. Design and calculation of a water heating system. Ventilation systems, their classification. Natural duct ventilation, design and calculation. Mechanical ventilation, advantages, disadvantages, scope of application, circuits, equipment. Air conditioning systems of buildings. |  |  |  |  |  |  |  |  | ѵ |  |  |  |
| 44 | Production Тechnology and Сonstruction Мachines | BD | EC | Construction Production Technology | **Purpose:** Formation of a system of knowledge, skills and abilities in the field of methods of performing individual construction processes in the production of construction works.  **Content:** Basic concepts and regulatory provisions. Rationing and remuneration. Technological design of construction processes. Geodetic breakdown of territories. Building structures and products, their transportation. Types of earthworks, soil compaction technology, pile construction. Technological processes for the construction of a building made of monolithic concrete. Installation of building structures made of reinforced concrete and metal structures. Masonry technology. Installation of protective and finishing coatings of buildings and structures. | 5 |  |  |  |  |  | ѵ |  |  |  |  |  | ѵ |
| 45 | BD | EC | Zero Cycle Construction Technology | **Purpose:** Formation of knowledge of the composition of zero-cycle construction works, the construction of foundations in the construction of buildings and structures for industrial and civil purposes.  **Contents:** The main requirements for engineering and geological surveys for underground structures. Physical, mechanical and construction properties of soils, engineering preparation of the construction site territory, geodetic support network, breakdown of earthworks, drainage and lowering of the groundwater level, temporary fastening of the walls of recesses and embankments, artificial soil fixation. Methods of excavation, soil compaction, methods of their mechanized production. Installation of underground structures and the aboveground part of the building. |  |  |  |  |  | ѵ |  |  |  |  |  | ѵ |
| 46 | PD | EC | Technology and Organization of Buildings and Structures Construction | **Purpose:** to obtain the theoretical foundations of modern methods and methods of organizing the construction of buildings and structures by various types of students.  **Content:** technological design of construction processes. Methods of construction of large-span buildings and structures. Installation of one-story industrial buildings with reinforced concrete and metal frames. Installation of multi-storey production buildings. Construction of large-panel buildings and volumetric elements. The method of lifting spacers and layers. Build buildings with brick walls. Fundamentals of the flow Organization of construction. Calendar planning of construction. Network planning of the construction of individual objects and complexes. General principles of design of construction master plans. Organization of the operation of construction machines. | 4 |  |  |  |  |  | ѵ |  |  |  | ѵ |  | ѵ |
| 47 | PD | EC | Organization of Buildings and Structures Construction | **Purpose**: To obtain practical fundamentals and theoretical knowledge of the organization and management of construction production.  **Content:** The composition and content of the PIC for a separate type of technically complex work. Installation of structures using a frame-hinge indicator. In-line production of installation and stone works. Participants and methods of construction. Customer's management bodies and construction management bodies. The main characteristics of technological models of construction of objects. Models used in the organization of construction. Tasks, functions and structure of production and technological equipment units (PTC). Forms of settlements and relationships of construction organizations with mechanization departments. Organizational and technological reliability of management systems. |  |  |  |  |  | ѵ |  |  |  | ѵ |  | ѵ |
| 48 | BD | EC | Power Effective Design and Construction of Civil Buildings | **Purpose:** The study of the basics of designing energy-efficient civil buildings and their design solutions.  **Content:** The essence of energy saving. Basic concepts in energy saving. The energy of water flows and their application in energy-efficient architectural design. Renewable and non-renewable energy resources. Analysis of the energy efficiency assessment system of buildings in the Republic of Kazakhstan and recommendations for their improvement and implementation. Secondary energy resources. Direct conversion of solar energy into thermal and electrical energy. Types of energy. The use of alternative energy sources. Priorities of energy saving and energy efficiency improvement. | 4 |  |  |  | ѵ |  |  |  |  | ѵ |  |  |  |
| 49 | BD | EC | Architectural design of Energy-Efficient Buildings | **Purpose**: To obtain additional knowledge necessary for the design of heat-efficient types of external enclosing structures and buildings aimed at energy conservation of buildings.  **Content:** Introduction to the element approach to determining the reduced resistance to heat transfer. Energy efficiency policy in the Republic of Kazakhstan. Analysis of the influence of local and extended heat-conducting inclusions, including the corners of external fences and window slopes, on the heat-protective properties of external fences. Types of heat-efficient external enclosing structures. |  |  |  | ѵ |  |  |  |  | ѵ |  |  |  |
| 50 | BD | EC | Construction Machines and Equipment | **Purpose:** Training a specialist who is deeply aware of the necessary information about construction machines and equipment for mechanization and automation of technological processes in construction, as well as the technological capabilities of machines, using them with the highest efficiency, depending on the characteristics of the construction object.  **Contents:** Transport, lifting, loading and unloading machines. Machines for earthworks. Drilling machines and equipment for pile work. Machines for crushing stone materials. Mixing machines. Machines and equipment for the preparation and transportation of concrete and mortar mixtures. Machines for plastering and painting works. Maintenance of construction machines. | 4 |  |  |  |  |  | ѵ |  |  |  |  |  |  |
| 51 | BD | EC | Machines for Excavation Works | **Purpose:** obtaining knowledge about the purpose, classification, arrangement of machines for earthworks, methods of mechanization and automation of technological processes in the construction of earthworks, technological capabilities of machines depending on soils.  **Contents:** General information about soils. Classification of earthmoving machines. The main parameters of earthmoving machines. Fundamentals of traction calculation of earth-moving machines. Passive brush cutters. Lever-type rooters. Harvesters-gatherers. Rippers. Bulldozers. Scrapers. Motor graders. Single bucket excavators. Continuous excavators. Machinery and equipment for frozen soils. Drilling machines and equipment for pile work. |  |  |  |  |  | ѵ |  |  |  |  |  |  |
| 52 | PD |  | Industrial practice ІІ | **Purpose:** to consolidate and deepen the theoretical knowledge gained by students in the process of studying at the university of disciplines related to the calculation and design of elements of buildings and structures.  **Content:** Introduction to the organizational structure and activities of the enterprise related to the design and construction of construction facilities. Acquisition of managerial skills in the practical activity of a student as a site manager and engineering positions in design and research organizations. Participation in certain types of design work as a designer, designer and calculator, consolidation of skills in the implementation of working drawings of buildings using modern information technologies. | 6 |  |  |  | ѵ | ѵ | ѵ |  |  |  |  |  |  |
| 53 | Grounds of Buildings and Тheir Еarthquake Resistance | PD | EC | Welding Works and Manufacturing Technology of Building Constructions | **Purpose:** Acquisition of practical skills in working with widely used methods of welding in the construction of civil and industrial buildings..  **Contents:** General characteristics and structure of steels. Welding works, classification of welds, the main types of welded joints, their operation and calculation are described. The scope of application of steel structures is described. The technological process of manufacturing steel structures, requirements for the assembly process, safety issues in the manufacture of technological metal structures are considered. The issues of performing welding work in production conditions are considered. | 4 |  |  |  |  |  |  | ѵ |  |  |  |  |  |
| 54 | PD | EC | Safety Management and Quality Control in Construction | **Purpose:** obtaining theoretical knowledge and practical skills in safety management, organization of quality control during production and acceptance of construction and installation works, objects.  **Contents:** Organization of safe working conditions and labor protection at the construction site. Safety requirements for the organization of work in winter conditions. Quality management of construction products. International standards, regulatory documentation on the quality of construction. Organization and means of quality control in construction. Organization of supervision over the quality of construction. Entrance, operational and acceptance control. Quality control during excavation, concrete, installation, stone, roofing, finishing works. Acceptance certificates of works. |  |  |  |  |  |  |  |  |  |  | ѵ | ѵ |
| 55 | BD | EC | Geotechnics І | **Purpose:** Formation of theoretical and practical knowledge in the field of engineering geology in relation to civil engineering, the basics of soil mechanics of foundations and foundations.  **Content:** Rocks. Classification of rocks by origin. Geological chronology. Igneous rocks. Sedimentary rocks. Conditions of accumulation and formation of marine and continental sediments. Tectonic movements of the Earth's crust and the forms of dislocations of rocks. Seismic phenomena. Aeolian deposits: dunes, dunes. Loess, their formation and building properties. Composition and properties of soils. The main methods of studying the physical properties of soils, including, taking into account the requirements of Eurocodes. | 4 |  |  |  |  |  |  | ѵ |  |  |  |  |  |
| 56 | BD | EC | Engineering Geology and Soil Mechanics | **Purpose:** Correct assessment of engineering and geological conditions of the construction site, forecasting of processes and phenomena arising from the interaction of structures with the natural environment and the behavior of soils under the influence of loads.  **Contents:** Fundamentals of geology. Hypotheses of the origin of the Earth. Physical properties and structure of the Earth. Gravity and the thermal regime of the Earth. Minerals and their rock-forming significance. Genetic classification of minerals. Characteristics of the main rock-forming minerals: origin, chemical composition, structure, physical properties. Deluvial processes and their role in the development of landslide phenomena. Proluvium. Alluvial deposits. Field and laboratory determination of the soil filtration coefficient. |  |  |  |  |  |  | ѵ |  |  |  |  |  |
| 57 | PD | EC | Geotechnics II | **Purpose:** Formation of theoretical and practical knowledge of soil mechanics, general provisions of modern methods of design and construction of foundations and foundations of construction production facilities.  **Contents:** The nature of soils and their physical properties. The main prerequisites and patterns of soil mechanics. Determination of stresses and deformations in soils. Fundamentals of the theory of the ultimate stress state of soils and their applications. Principles of designing bases based on limit states. Choosing the type and depth of foundation laying. The sequence of foundation design, including taking into account the requirements of Eurocodes. Types of piles and pile foundations, their classification. Determination of the bearing capacity and design resistance of the pile. The procedure for calculating and designing a pile foundation, including taking into account the requirements of the Eurocode. | 4 |  |  |  |  |  |  | ѵ |  |  |  |  |  |
| 58 | PD | EC | Ground and Foundation | **Purpose:** Mastering the basic principles of designing foundations and foundations, and earthworks; the sequence of design and methods of construction of foundations and foundations of shallow and deep laying.  **Content:** Assessment of the interaction of structures with the foundation: assessment of the rigidity of structures; types of deformations of structures and foundations, taking into account their joint work. The sequence of foundation design. Calculation of precipitation and checking the pressure on the underlying layer of weak soil. Types of piles and pile foundations, their classification. The order of calculations and design of the pile foundation. Foundations on subsidence, swelling, saline, weak, bulk, eluvial and rocky soils. | 4 |  |  |  |  |  |  | ѵ |  |  |  |  |  |
| 59 | PD | EC | Design of Aseismic Structures | **Purpose:** To study the features of calculation and design of buildings and structures in seismic active zones.  **Contents**: Basic principles of designing civil and industrial earthquake-resistant buildings and structures. A set of maps for determining the seismic hazard of the territory of the Republic of Kazakhstan. Determination of seismic loads on the building. Design of earthquake-resistant buildings and structures of various structural systems, taking into account the requirements of Eurocodes. Design requirements of regulatory documents in the design of buildings in seismic zones. | 6 |  |  |  |  | ѵ |  |  | ѵ |  |  |  |  |
| 60 | PD | EC | Calculation of Structures for Dynamic Effects | **Purpose:** The study of the design features of structures taking into account dynamic loads of a harmonic nature.  **Contents:** Fundamentals of the dynamics of structures. Free oscillation of the system. Forced oscillation of the system. Dissipative properties of the system. Calculation of the building structure for single impact impacts. Calculation of the building structure for dynamic loads of a harmonic nature. The phenomenon of resonance. Consideration of the influence of the resonance process in the design calculation. Construction of building elements. Features of the calculation of buildings and structures for dynamic impacts, taking into account the requirements of Eurocodes using modern computer programs of a computational nature. |  |  |  |  | ѵ |  |  | ѵ |  |  |  |  |
| 61 | Calculation and Design of Building Structures with the use of the Eurocodes | PD | EC | Design of Steel Constructions | **Purpose:** Obtaining in-depth knowledge on the design and calculation of elements of steel structures; Learning the basics of building design in the field of construction.  **Contents:** The basic requirements for the design of steel structures, the principles of calculation according to limit conditions, the basics of designing steel structures according to Eurocodes, taking into account National applications. Loads and impacts. Welded and bolted connections. Beams and girder structures calculation, design and layout. Section selection and column construction. The field of application of farms, calculation and design. Selection of cross sections, ensuring the overall stability of farms in the coating system. | 5 |  |  |  |  | ѵ |  |  | ѵ |  |  |  |  |
| 62 | PD | EC | Design of Light Constructions | **Purpose:** Obtaining in-depth knowledge on the design and calculation of light metal structures.  **Contents**: Basic requirements for the design of lightweight (aluminum) structures, principles of calculation according to limit conditions. Advantages and disadvantages of lightweight metal structures. Manufacture and types of profiles of light metal structures. The main areas of application. Loads and impacts. Design and layout of lightweight beams. Beams with a perforated wall. Designing lightweight farms. Lightweight frame and spatial structures. |  |  |  |  | ѵ |  |  | ѵ |  |  |  |  |
| 63 | PD | EC | Metal Constructions of Industrial and Civil Buildings | **Purpose:** Gaining knowledge about the basics of designing and calculating various elements of the frames of industrial and civil buildings.  **Content:** The main issues of design, layout of structures of frames of industrial and civil buildings. Taking into account the requirements of unification and operation. Types of loads acting on the frame of buildings. Accounting for different combinations of efforts. The actual operation of the frame under load. Construction of farms of industrial buildings. Calculation and design of columns of industrial and civil buildings. Design features of large-span buildings and structures. Large-span ceilings. Beam, frame, and arched structures. Shells, domes. | 4 |  |  |  |  | ѵ |  |  | ѵ |  |  |  |  |
| 64 | PD | EC | Design of Sheet Constructions | **Purpose:** Gaining knowledge about the basics of designing and calculating various sheet structures.  **Content:** The main issues of design, layout of sheet structures, calculation of limit conditions. Fundamentals of the design of sheet structures, taking into account the requirements of standards identical to the European Standards, taking into account National applications. Types of loads acting on sheet structures. Accounting for different combinations of efforts. Types and features of sheet structures, the main provisions of the calculation. Vertically and horizontally cylindrical, spherical tanks. Wet, dry gas tanks of variable and constant. |  |  |  |  | ѵ |  |  | ѵ |  |  |  |  |
| 65 | PD | EC | Design of Reinforced Concrete Construction | **Purpose:** To study the issues of designing elements of reinforced concrete structures according to limit conditions in accordance with the requirements of regulatory documents of the Republic of Kazakhstan, identical to Eurocodes.  **Contents:** Basic concepts of reinforced concrete, the essence of reinforced concrete, the basics of calculating elements of reinforced concrete structures in accordance with Eurocodes, rationing of partial safety coefficients; characteristic and calculated values of impacts, calculated combinations of impacts; characteristic and calculated characteristics of concrete and reinforcement and their classification. Methodology of calculation of elements of reinforced concrete structures according to critical limit conditions and suitability for operation at various VAT (bent, compressed and stretched). | 6 |  |  |  |  | ѵ |  |  | ѵ |  |  |  |  |
| 66 | PD | EC | Design of Stone Constructions | **Purpose:** Study of the design of stone and reinforced stone structures of buildings and structures  **Contents:** The main properties of non-reinforced, reinforced, prestressed masonry (strength and deformability). Complex structures (masonry with reinforced concrete reinforcement). Methodology of calculation and design of elements (bent, compressed, stretched, working for crumpling) of stone and reinforced stone structures. Determination of design parameters of stone and reinforced stone buildings and structures or their elements from these stone structures, taking into account the requirements of Eurocodes. Structural solutions of buildings made of non-reinforced, reinforced masonry and complex structures |  |  |  |  | ѵ |  |  | ѵ |  |  |  |  |
| 67 | PD | EC | Reinforced Concrete Constructions of Industrial and Civil Buildings | **Purpose:** To study the issues of designing reinforced concrete structures of buildings for various purposes.  **Contents:** Structural schemes of multi-storey civil and industrial buildings made of reinforced concrete and design issues of their structural elements: structures in monolithic and prefabricated versions of the construction of buildings in accordance with the requirements of the construction regulations of the Republic of Kazakhstan, identical to Eurocodes. Methodology of calculation and design of elements of multi-storey industrial buildings (frame structures, ceilings, foundations, connections). Calculations and construction of reinforced concrete structures of single-storey industrial buildings in accordance with the Joint Venture of the Republic of Kazakhstan. identical to Eurocodes. Static calculation of the transverse frame of the OPZ, compilation of unfavorable combinations of forces of calculation situations). | 5 |  |  |  |  | ѵ |  |  | ѵ |  |  |  |  |
| 68 | PD | EC | Design of Steel-reinforced Concrete Constructions | **Purpose:** To study the issues of designing buildings using steel-reinforced concrete structures in accordance with the Joint Venture of the Republic of Kazakhstan, identical to Eurocodes.  **Contents:** Structural schemes of high-rise buildings, rules of design, calculation and construction of steel-reinforced concrete structures of civil buildings. Structural solutions of steel-reinforced concrete elements and components of load-bearing frames, walls and ceilings of multi-storey and high-rise buildings. Recommendations on the development of calculation schemes for the frames of multi-storey buildings made of steel-reinforced concrete structures, collecting loads and performing static and dynamic calculations taking into account the requirements of the Joint Venture of the Republic of Kazakhstan, identical to Eurocodes. |  |  |  |  | ѵ |  |  | ѵ |  |  |  |  |
| 69 | PD | EC | Computer Calculations of Buildings and Structures | **Purpose:** To study methods for calculating buildings and structures of various design schemes using computer programs.  **Content:** Creation of design schemes of buildings and structures of various structural systems. Setting boundary conditions. Setting the stiffness characteristics of rod, flat and volumetric elements. Setting loads on structural elements of buildings. Calculation of buildings and structures of various structural systems for the effects of loads of the main and special combination; Design of elements taking into account the requirements of Eurocodes. | 4 |  |  |  |  |  |  |  | ѵ |  |  |  |  |
| 70 | PD | EC | Automation of Calculation and Design of Building Constructions | **Purpose:** To study methods for calculating buildings and structures of various design schemes using MIDAS computer programs.  **Content:** Creation of design schemes of buildings and structures of various structural systems using a MIDAS PC. Creation of a design scheme of flat systems. Creation of a design scheme of spatial systems. Setting boundary conditions. Setting the stiffness characteristics of rod, flat and volumetric elements. Setting loads on structural elements of buildings. Design of elements taking into account the requirements of Eurocodes. |  |  |  |  |  |  |  | ѵ |  |  |  |  |
| 71 | Building Survey and Construction Economics | PD | EC | Construction Economics and Cost Estimates | **Purpose:** Formation of modern theoretical, practical and economic knowledge in the conditions of market relations and practical activities in the field of construction.  **Content:** Fundamentals of entrepreneurship in construction. Fixed assets and labor resources in construction. Cost of production, profit and profitability in construction. Issues of drawing up the estimated cost of construction and installation works, building materials, products and structures by the resource method. Regulatory documents for the preparation of estimates. Methodology for calculating local, object estimates and estimated, summary calculation of the cost of construction. | 4 |  |  | ѵ |  |  |  |  | ѵ |  |  |  |  |
| 72 | PD | EC | Project Management | **Purpose:** Formation of theoretical knowledge and practical skills for construction project management  **Content:** Features of construction projects and principles of their management. The composition of the project documentation for the construction object. Project life cycle analysis. Re-approval of projects. Principles of determining the composition of construction works, determining their sequence, estimating their duration; developing a schedule and monitoring the schedule of work. Resource planning, cost estimation, budgeting, cost control. Determination of productivity; analysis of the problem of productivity in construction. Factors influencing the success of the project, key performance indicators of the project. |  |  |  |  |  | ѵ |  |  |  | ѵ |  |  |
| 73 | PD | EC | Inspection, Test and Reconstruction of Buildings and Structures | **Purpose:** Obtaining practical skills in inspection, testing and reconstruction methods in order to ensure trouble-free operation of construction facilities with the longest possible service life.  **Content:** Methods of organizing and conducting the survey. General characteristics of the examination methods. Inspection of the foundations and foundations of buildings, walls, columns, and other building elements. The actual working conditions of the structures. Examination and organization of internal quality control systems for the examination. Inspection of the structure and control check of dimensions and sections. Quality tests of the condition of materials and compounds. Sampling. Non-destructive testing methods and reviewing the conclusion of the examination of construction facilities. Conducting static and dynamic tests. Strengthening the foundations and reconstruction of the foundations of existing buildings based on the calculation of soil resistance, taking into account the changed VAT. | 4 |  |  |  |  |  |  |  |  |  |  | ѵ | ѵ |
| 74 | PD | EC | Technical Operation of Buildings and Structures | **Purpose:** Mastering professional knowledge on ensuring safety for users of buildings (structures) and organizational basics of maintenance of erected construction facilities.  **Contents:** Types of operational safety and classification of buildings and structures by types of operating conditions, taking into account their functional purpose. The composition and content of the section of the project documentation "Requirements for the safe operation of a capital construction facility". Responsibilities of the building and structure maintenance service. Organizational bases of operational control. Organizational bases of maintenance of buildings and structures. Operation of load-bearing structures.. Operation of enclosing structures. Operation of engineering and technical support systems |  |  |  |  |  |  |  |  |  |  | ѵ | ѵ |
| 75 | Module of Acquisition of New Professional Competencies | BD | EC | Subjects on the Additional Educational Program | An additional educational program (Minor) is a set of disciplines and (or) modules and other types of educational work determined by the student for study in order to form additional competencies. | 12 |  |  |  |  |  |  |  | ѵ |  |  |  |  |
| 76 | Module of Final Certification | PD |  | Pre-degree or Industrial Practice | **Purpose:** Formation of practical skills in the field of building construction, acquisition of work experience on the construction site and deepening of theoretical knowledge necessary for the successful completion of the final certification.  **Content:** Familiarity with the initial data for the design. Calculation of building elements. The issues of improving managerial and organizational skills in production, the ability to apply modern economic knowledge and electronic computing technology will be raised. Collects and processes materials for graduation design. | 10 |  |  |  |  | ѵ |  |  | ѵ |  | ѵ |  |  |
| 77 |  |  | Writing and Defending a Thesis, a Graduate work, or Preparing and Passing a Comprehensive Exam | **Purpose:** formation of practical skills in the field of building construction, acquisition of work experience on the construction site and deepening of theoretical knowledge necessary for the successful completion of the final | 8 |  |  |  | ѵ | ѵ |  |  | ѵ |  | ѵ |  |  |
|  |  |  |  | **Total** |  | **240** |  |  |  |  |  |  |  |  |  |  |  |  |

**5. Summary table reflecting the volume of disbursed loans by EP modules**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Course of study | Semester | Amount of the mastered modules | Amount of the studied disciplines | | | Amount of KZ credits | | | | | Total in hours | Total KZ credits | Amount | |
| Compulsory component | University component | Optional component | Theoretical training | Physical education | Training practice | Production and Predegree practice | Final attestation | exam | dif.cr.test |
| 1 | 1 | 3 | 3 | 2 | 2 | 28 | 2 | - | - | - | 900 | 30 | 6 | 1 |
| 2 | 4 | 5 | 1 | 1 | 27 | 2 | 1 | - | - | 900 | 30 | 5 | 3 |
| 2 | 3 | 5 | 2 | 3 | 3 | 28 | 2 | - | - | - | 900 | 30 | 6 | 2 |
| 4 | 6 | 3 | 1 | 2 | 23 | 2 | - | 5 | - | 900 | 30 | 5 | 2 |
| 3 | 5 | 4 |  | 1 | 6 | 30 |  | - | - | - | 900 | 30 | 5 | 2 |
| 6 | 4 |  | 1 | 4 | 24 |  | - | 6 | - | 900 | 30 | 3 | 2 |
| 4 | 7 | 2 |  | - | 4 | 21 |  | - | - | - | 630 | 21 | 4 | - |
| 8 | 2 |  | - | 5 | 21 |  | - | - | - | 630 | 21 | 4 | 1 |
| 9 | 1 |  |  |  |  |  |  | 10 | 8 | 540 | 18 |  | 1 |
| **Total** | | **13** | **8** | **8** | **27** | **202** | **8** | **1** | **21** | **8** | **7200** | **240** | **38** | **14** |

**6. Strategies, teaching methods and artificial intelligence, monitoring and assessment**

|  |  |
| --- | --- |
| **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.  • \* machine learning methods  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 jobs;  • 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 for EP**

|  |  |
| --- | --- |
| **Information Resource Center** | 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 their own generation have been created: "Almamater", "Works of scientists of SKU", "Electronic Archive". Online access from any device 24/7 via an external linkhttp://articles.ukgu.kz/ru/pps.  Catalogs are processed electronically. The EC consists of 9 databases: "Books", "Articles", "Periodicals", "Works of the teaching staff of SKU", "Rare books", "Electronic Fund", "SKU 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** | The department has 3 laboratory classrooms equipped with modern power and measuring equipment, hydraulic machines of various capacities, test benches, strain gauges and recording equipment of the type AID-4M, CTM, instruments and devices of non-destructive testing methods, a set of geodetic instruments and other instruments and devices in accordance with the standard of education and the curriculum of the specialty. The department's laboratories are located in classrooms 114B (48m2), 409B (77m2) and on the technical floor (108m2). They cover the most important sections of special disciplines and fully ensure the learning process.  On the basis of "Justalcon" LLP in Shymkent, an educational and production center has been established and is functioning, where practical and laboratory classes on special disciplines of the department are currently being conducted. There are bilateral agreements with enterprises and universities.  According to the preliminary agreement of the department, all types of practices are held in advanced construction, research and design organizations. At the request of some organizations, practical training at other enterprises is carried out in coordination with the administration of the SKU. The practice is carried out by order of M.Auezov SKU. The main bases of internship at the department are located in the city of Shymkent: The department has equipped 9 classrooms in various special disciplines, including a methodical office, a course and diploma design office (401B 410B, 411B, 412B, 413B, 414B, 416B). The department has a computer classroom (409B, 320B) equipped with modern computers, as well as classrooms equipped with interactive whiteboards (rooms 404B and 403B, 101B).  In the current academic year, applications for public procurement for the purchase of laboratory instruments have been made and a positive decision has been received. |

**APPROVAL** **SHEET**

on the Education Program «**6В07320 – «Civil Engineering**»

Director of DAA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Naukenova A.S.

Director of DASс \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Nazarbek U.B.

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