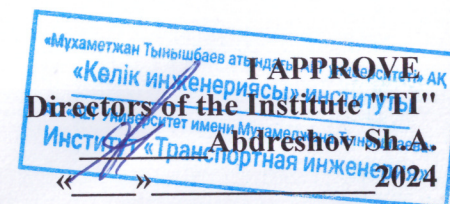


AGREED
Director of the branch of JSC " NC "" KTZ " –
"Almaty branch of the backbone network"

Zheksenbiev A. T.

2024



CATALOG OF ELECTIVE COMPONENT DISCIPLINES

6B07336- Railway construction, track and facilities

EDUCATIONAL PROGRAM

Education level: Bachelor's degree Duration of study: 4 years

Year of admission: 2024

Cycle	Component	Name of the discipline	Total labor		intensity Semester	Learn ing outco mes	Brief description	of the discipline	Prerequisites
			Post requirem ents academi c hours	acade mic credit s					
1	2	3	4	5	6	7	8	9	10
OOD	KV	Ecology and life safety	150	5	3	PO5	The discipline studies the main approaches to solving environmental problems, ensuring safe life, sources and types of pollutants of construction production, methods of reducing emissions of harmful substances into the environment, natural and man-made emergencies, their causes, methods of prevention and protection, environmental protection, rescue and other urgent work, rules of behavior of people in extreme conditions	History of Kazakhstan, Kazakh (Russian, foreign) language, Professional foreign language, Sociology, Cultural studies, Political Science, Psychology	Final certification
		Scientific research methods				PO9	The discipline provides knowledge and ideas about the content of scientific activity, its methods and forms of knowledge. The theoretical and applied knowledge obtained by students on the methods of scientific research of problems in the studied area, instills in future specialists, cognitive skills in the field of science.	History of Kazakhstan, Kazakh (Russian, foreign) language, Professional foreign language, Sociology, Cultural Studies, Political Science, Psychology	Final certification

		Economics and business activities	150	5	3	PO6	The discipline studies the activities of enterprises in various types of markets, the model of equilibrium and functioning of the market, government regulation of prices and tariffs. Examines the concept of entrepreneurship and the limits of its legal regulation, conditions for the development of entrepreneurship, organizational and legal forms of doing business, as well as issues of business planning, business secrets, social responsibility of entrepreneurship	History of Kazakhstan, Kazakh (Russian, foreign) language, Professional foreign language, Sociology, Cultural Studies, Political Science, Psychology	Final attestation
OOD	KV	Basics of law and anti-corruption culture	150	5	3	PO9	The discipline outlines the fundamental concepts of law, the constitutional structure of the state power of the Republic of Kazakhstan, the rights and freedoms of citizens enshrined in the Constitution, the mechanism and protection of legitimate human interests in case of their violation. The discipline forms students' improvement of public and individual legal awareness and legal culture, as well as a system of knowledge and citizenship on combating corruption as an antisocial phenomenon.	History of Kazakhstan, Kazakh (Russian, foreign) language, Professional foreign language, Sociology, Cultural Studies, Political Science, Psychology	Final attestation
BD	KV	Theoretical mechanics	180	6	3	PO2	The purpose of the discipline is to form logical thinking and the scientific foundation of engineering education. He studies the laws of motion and equilibrium of material bodies, the construction of mathematical models of the behavior of mechanical systems using the theorems of mechanics, the use of methods for studying the equilibrium and motion of mechanical systems to solve technical problems	Engineering mathematics, Applied Physics.	Strength of materials, Structural mechanics
BD	KV	Fundamentals of classical mechanics	180	6	3	PO5	The purpose of the discipline is to form logical thinking and the scientific foundation of engineering education. He studies the basic concepts, axioms, laws and theorems that make it possible to compose equations describing the behavior of systems, a specific phenomenon in mathematical form, mathematical models of the behavior of material bodies, the basic methods of classical mechanics in the study of motion and equilibrium of mechanical systems in the study of disciplines of the professional cycle.	Basic school knowledge in physics	Construction mechanics, Mechanics of structural strength

BD	KV	Strength of materials	180	6	4	PO2	Formation of a set of knowledge in the field of engineering calculations for simple and complex resistance to strength, rigidity and stability of structural elements that provide the required reliability and safety of products under static and static conditions. dynamic loads using the forms of static equilibrium conditions, using the methods of differential and integral calculus. Active learning methods – performing individual calculation and graphic tasks.	Engineering mechanics 1, Geology and soil mechanics,	Construction mechanics, Engineering mechanics 3, Track, construction machinery and equipment, Track
BD	KV	Applied mechanics	180	6	4	PO2	The purpose of the discipline is to form a theoretical basis for students to understand the methods of calculating the strength, rigidity and stability of elements of machinery and equipment, ensuring its reliability and efficiency. Studies deformations and strength conditions of bodies and provides the general foundations necessary to ensure the reliability of a structure for any purpose, the correct calculation of the dimensions of structural elements and parts.	Engineering mathematics 1,2 Geology, soil mechanics, bases and foundations, Engineering geology hydrogeology	Construction mechanics, Track, construction machinery and equipment, Machines and mechanisms in the travel Industry
BD	KV	Construction mechanics	180	6	5	PO2	The purpose of the discipline is to choose the right structural forms and materials that provide the required indicators of reliability, safety and efficiency of both operated and created structures and structures. Studies the basic methods of calculating structural elements and structures for strength, rigidity and stability, to calculate the load-bearing elements of transport structures and structures for reliability and durability, taking into account the time-varying mechanical properties of the materials used.	Engineering mathematics, Applied physics	Railway construction technology, Technological processes of railway construction, Organization of transport construction, Organization and planning of construction of transport facilities
BD	KV	Mechanics of structural strength	180	6	5	PO2	The purpose of the discipline is to develop skills in the field of work analysis and calculation of structures made of various materials under various influences using modern computing equipment. Studies the features of the laws of stress and strain distribution in structural elements under various conditions of external load, principles and methods of static and dynamic calculation of engineering structures for strength, rigidity, stability.	Engineering mathematics, Applied physics	Railway construction technology, Technological processes of railway construction, Organization of transport construction, Organization and planning of construction of transport facilities

BD	KV	Fundamentals of the design of transport facilities	180	6	2	PO4	The purpose of the discipline is the formation of knowledge and skills in the use of computer-aided design of artificial structures using the AutoCAD software package. He studies the basic elements of the design of communication routes, highways, the main elements of airfields and airports, bridges and transport interchanges, teaches how to work in text editors and spreadsheets to implement rational principles of designing transport structures.	Engineering mathematics, Applied physics	Bridges and tunnel on railways, Railway survey and design, Reconstruction of railways lines, Reconstruction of railways
BD	KV	Descriptive geometry and engineering graphics	180	6	2	PO4	The purpose of the discipline is to form a theoretical basis for students to perform and read technical drawings, make sketches of details and master various ways of depicting geometric shapes, develop spatial constructive geometric thinking, the ability to represent and understand spatial bodies and their relationships. They study the ways of constructing various geometric spatial shapes, methods and rules for creating accurate and understandable graphic projects.	Engineering mathematics, Applied physics	Bridges and tunnel on railways, Railway survey and design, Reconstruction of railways lines, Reconstruction of railways
BD	KV	Geology, soil mechanics, foundations and foundations	180	6	3	PO3	The purpose of the discipline is to study the basic principles and methods of engineering geology and hydrogeology necessary for the assessment of geological and hydrogeological conditions in the design, construction and operation of engineering structures. The course covers the basic concepts and principles of engineering geology and hydrogeology, assessment of the physical and mechanical properties of soils and rocks, the influence of geological factors on the construction and operation of engineering structures.	Engineering mathematics, Applied Physics	Strength of materials
BD	KV	Engineering geology hydrogeology	180	6	3	PO3	The purpose of the discipline is to study the basic principles and methods of engineering geology and hydrogeology necessary for the assessment of geological and hydrogeological conditions in the design, construction and operation of engineering structures. The course covers the basic concepts and principles of engineering geology and hydrogeology, assessment of the physical and mechanical properties of soils and rocks, the influence of geological factors on the construction and operation of engineering structures.	Descriptive geometry and engineering graphics, Mathematic	Building construction, Strength of materials

BD	KV	Track, construction machines and equipment	180	6	6	PO8	The purpose of the discipline is to study the structures of track and construction machinery and equipment. Forms knowledge on the technical capabilities of small-scale mechanization, energy supply of track and construction, loading and unloading machines and mechanisms when used for updating, repairing and current maintenance of the upper structure of the track and small artificial structures.	Ecology and life safety, Engineering geodesy, Construction materials, Engineering geodesy	Railway connections and crossings, Technology and mechanization of railway maintenance, Organization and planning of railway maintenance, Production practice 1,2
		Machines and mechanisms in the travel Industry				PO8	The purpose of the discipline: to prepare students for production activities in the field of mechanization and automation of repair, construction and current maintenance of railway tracks using track machines and mechanisms, the study of types, technical and dimensional parameters and design of track machines and mechanisms, their scope of application	Ecology and life safety, Engineering geodesy, Construction materials, Engineering geodesy	Railway connections and crossings, Technology and mechanization of railway maintenance, Organization and planning of railway maintenance, Production practice 1,2
PD	KV	Technological processes of railway construction	180	6	7	PO7	The purpose of the discipline is to form knowledge of the technological process performed during the construction of railways. Studies the methods and means used for the effective and high-quality performance of construction activities, including preparatory work, laying of railway tracks, construction of artificial structures, organization and control of technological processes, planning and coordination of construction work, ensuring safety and compliance with regulatory requirements.	Building materials, Track, construction machines and equipment, Machines and mechanisms in the travel Industry	Organization of transport construction, Organization and planning of construction of transport facilities, Reconstruction of railways lines, Reconstruction of railways
PD	KV	Railway construction technology	180	6	7	PO7	The study of the basic provisions of technology and mechanization of railway construction, the composition of construction works and processes, methods of design and development of technological processes for the construction of railway earthwork, track laying, track ballasting, construction of contact network supports for electrified sections of the main network.	Building materials, Artificial structures on railways, Railway track construction, Track, construction machinery and equipment, Track management Mechanization	Organization of construction of transport infrastructure facilities, Organization and planning of construction of transport structures, Reconstruction of railways, Reconstruction of railway lines

PD	KV	Organization of transport construction	180	6	8	PO7	The purpose of the discipline is the formation of professional skills on the main principles and methods of organizing road work, organizational and technical training and calendar planning of road work, as well as obtaining knowledge in the field of production activities enterprises choose rational options for organizational and plan decisions, ensuring the improvement of economic efficiency of production. It defines the principles and methods of Project Management, Control and planning of time, resource allocation.	Building materials, Track, construction machines and equipment, Machines and mechanisms in the travel Industry	Reconstruction of railway lines, Reconstruction of railways, Production practice 2.
PD	KV	Organization and planning of construction of transport facilities	180	6	8	PO7	The purpose of the course is to form knowledge about the principles of organization, construction planning and applying them in practice. The course examines the stages of preparation for the production of construction works, organizational and technological design documentation, the composition and content of the construction organization project (PIC) and the work production project (PPR), the development of network schedules and calendar plans, criteria for choosing optimal organizational and technological solutions for the construction of transport structures.	Building materials, Bridges and tunnels on railways, Track, construction machines and equipment, Machines and mechanisms in the travel Industry	Reconstruction of railway lines, Reconstruction of railways, Production practice 2.
PD	KV	Reconstruction of railway lines	180	6	7	PO10	The purpose of the discipline is to form comprehensive knowledge about the elements of technical solutions for the design of the plan, longitudinal profile and transverse profiles of railways and HSR. Studies methods for solving problems of designing the reconstruction of the plan and longitudinal profile, technologies for collecting and processing data on the technical condition of the railway for design, taking into account the use of geoinformation technologies, performing design tasks in conditions of increased load.	Bridges and tunnels on railways, Railway surveys and design, Organization of transport construction, Organization and planning of construction of transport facilities	Production practice 2, FINAL CERTIFICATION
PD	KV	Reconstruction of railways	180	6	7	PO10	The study of the main technical parameters and means of technical equipment, the plan and profile of the operated railway, their reconstruction to comply with building codes and regulations while increasing train speeds, traffic growth, with the choice of a scheme for phased increase in road capacity according to economic and technical indicators	Bridges and tunnels on railways, Railway surveys and design, Organization of transport construction, Organization and planning of construction of transport facilities	Production practice 2, FINAL CERTIFICATION

PD	KV	Managerial economics	90	3	6	PO6	Formation of the conceptual apparatus and development of skills of economic analysis using modern models and patterns of economic science, consideration of economic problems and challenges facing the head of the firm. The study of this discipline will allow students to obtain and develop knowledge in the field of analytical research of economic, technological and technical parameters of the enterprise, as well as allow you to master the skills of using special methods of economic justification of management decisions and assessment of their consequences.	Engineering mathematics, Fundamentals of economics and entrepreneurship	Organization of construction of transport infrastructure facilities, Organization and planning of construction of transport structures, Reconstruction of railways, Reconstruction of railway lines
PD	KV	Time management	90	3	6	PO6	The discipline studies a system of methods, tools and approaches that are aimed at effective time management in order to achieve set goals. The course is designed to improve skills in organizing and optimizing the use of working time, increasing productivity, reducing stress, planning, delegation, using tools and technologies, as well as knowing your time and energy rhythms in order to use your time effectively.	Sociology, Cultural Studies, Psychology, Philosophy, Engineering Mathematics.	Organization of construction of transport infrastructure facilities, Organization and planning of construction of transport structures, Reconstruction of railways, Reconstruction of railway lines
BD	KV	Fundamentals of financial literacy	90	3	5	PO5	Formation of general functional economic and financial literacy, mastering methods and tools of economic and financial calculations for solving practical problems	Engineering Mathematics 1,2	Managerial economics, Final certification

BD	KV	Critical thinking	90	3	5	PO5	The discipline studies the forms and techniques of rational cognition, the creation of a general idea of logical methods and approaches used in the field of professional activity, the formation of practical skills of rational and effective thinking.	Engineering Mathematics 1,2	Managerial economics, Final certification
Total			2820	83					

Head of the Department «Civil engineering»



Kulmanov K.S.