CATALOG OF DISCIPLINES OF THE COMPONENT BY CHOICE

EDUCATIONAL PROGRAMS **6B07134 Cars, track and construction vehicles**

Education level: Bachelor's degree **Duration of study: 4 years** **Year of admission: 2023**

AGREED
Chief mechanic
«Almaty Zholdary» LLP
_____ Zhunisbekov B.
«30» 03 2023

APPROVED
Director of the institute
Transport Engineering
_____ Chigambayev T.
«30» 03 2023

Cycle	Component	Name of the discipline	Total labor intensity		Term	Learning outcomes	Brief description of the discipline	Prerequisites	Post-requirements
			в академических часах	в академических кредитах					
1	2	3	4	5	6	7	8	9	10
ООД	КВ1	Ecology and Railways	150	5	3	РО3	The study of basic environmental concepts, environmental problems and approaches to their solution, sources and types of environmental pollution by enterprises, the principles of rationing the quality of atmospheric air and water, the main provisions of legislation in various fields, natural and man-made emergencies, their causes, methods of prevention and protection. Teaching methods - analysis of specific situations (case-study), group discussions	Basic school knowledge of ecology	Labor protection
	КВ2	Methods of scientific research				РО1 РО11 РО12	Obtaining theoretical and applied knowledge by students on the methods of scientific research of problems in the studied area, training specialists with cognitive skills in the field of science, forming deep ideas about the content of scientific activity, its methods and forms of knowledge.	Socio-political knowledge module	Educational practice, Industrial practice 1, Industrial practice 2, Final

							training specialists with cognitive skills in the field of science, forming deep ideas about the content of scientific activity, its methods and forms of knowledge.	module	practice 1, Industrial practice 2, Final certification
	KB3	Fundamentals of Economics and Entrepreneurship				PO4	Studies the activities of enterprises in various types of market, the model of equilibrium and functioning of the market, state 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, business planning, business secrecy, social responsibility of entrepreneurship. Active teaching methods: case methods; business role-playing games, group work.	Socio-political knowledge module	Managerial Economics, Time Management
	KB4	Fundamentals of law and anti-corruption culture				PO12	Improving public and individual legal awareness and legal culture of students, as well as the formation of a knowledge system and a civic position on combating corruption as an antisocial phenomenon. As a result of studying the course, the student must master 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.	Socio-political knowledge module	Managerial Economics, Time Management
БД	KB5	Fundamentals of calculating the strength of machines and mechanisms	180	6	4	PO5	Studies the basics of the theory of mechanisms and machines, the resistance of materials, calculation and design of general-purpose parts and assemblies widely used in machines to solve problems aimed at improving the reliability, strength and durability of parts and assemblies in design, construction and operation, using modern educational and information technologies. Methods of active learning – performing individual computational and graphical tasks.	Information and communication technologies, Fundamentals of computer modeling	Power plants of transport equipment, Machine parts and design basics

	КВ6	Applied mechanics				РО5	Studies the theoretical foundations and methods of calculations for strength, rigidity, durability and stability of structural elements of transport structures, the main types of mechanisms, parts and assemblies of machines, general principles of design and construction, which is necessary when assessing the reliability of existing equipment in operating conditions. Methods of active learning – performing individual computational and graphical tasks.	Information and communication technologies, Fundamentals of computer modeling	Machine parts and design basics, Fundamentals of machine automation and Robotics
БД	КВ7	Hydraulics and hydraulic drive	180	6	5	РО10	Studies general laws and equations of fluid dynamics, fluid motion modes and fundamentals of hydrodynamic similarity, laminar and turbulent fluid motion, hydraulic resistances, fluid flow through holes and nozzles, hydraulic calculation of pipelines, volumetric hydraulic machines, hydraulic drives and hydraulic automation, pneumatic drive, pneumatic motor, pumps, hydraulic motors, fans, hydrodynamic gears, hydraulic drives metal-cutting tools. The teaching methods are: problem solving, conducting thematic surveys, open and closed tests.	Engineering mathematics, Fundamentals of computer modeling,	Lifting and transport machines and mechanisms, Mechanization and automation of loading and unloading operations
	КВ8	Tribotechnics				РО7 РО10	Studies the basic concepts of contacting and friction of touching surfaces, basic definitions and formulation of the problem, analysis of contact and contact area, sliding friction, rolling friction, hydrodynamic friction, main characteristics and types of wear, methods for ensuring high operational properties of friction units and the specifics of the design of friction units, the basics of calculations in the design of sliding bearings, rolling, durability assessment friction nodes. Interactive teaching methods are used within the discipline.	Engineering Mathematics, Machine Parts and Design Basics	Machinery and equipment for construction, Lifting and transport machines and mechanisms
БД	КВ9	Technological equipment of the ATP	180	6	5	РО9	Studies the principles and methods of operation, the basics of designing technological equipment; repair systems and maintenance of technological equipment. Theoretical and practical issues of the purpose, device and principle of operation of technological equipment are considered; prospects for the development of technological equipment and complexes. As part of the study of the discipline, interactive teaching methods, a computational and analytical method using AutoCAD	Electrical engineering and the basics of electronics, Structural materials in transport engineering, Fundamentals of calculating the	Fundamentals of technical operation of transport equipment, Fundamentals of production technology and repair of transport

							computer programs, situational tasks, and discussion are used.	strength of machines and mechanisms	equipment
	KB10	Fundamentals of machine automation and Robotics				PO7 PO9	To compare basic information on solving scientific and practical problems in the creation, modernization and operation of computer-aided design systems of technical means and robotic systems; to study the basics of methods for forming mathematical models of automation and control objects, methods of computer-aided design and control systems of objects of various nature, using modern computer technologies; introduction of software and hardware design automation tools of the latest generations in order to develop technical means and control systems on a modern element base.	Engineering Mathematics, Electrical engineering and the basics of electronics, Theoretical mechanics,	Lifting and transport machines and mechanisms, Fundamentals of technical operation of transport equipment
БД	KB11	Theory of car movement	270	9	6	PO8	To teach students to analyze technical and economic indicators and evaluate the effectiveness of the operational properties of vehicles, to develop a strategy for improving, improving the quality of the operational properties of various vehicles. Within the framework of this discipline, theoretical and practical properties are considered: traction and high-speed motor vehicles, braking properties of motor vehicles, operational properties of rolling stock of motor transport; calculations of the power and power balance of the car, calculations of acceleration, braking of the car, speed and length of the braking distance; calculation of travel and operational fuel consumption; issues of turnability, controllability, of the car. The course ends with the defense of the project for calculating the traction and speed properties of the car.	Fundamentals of transport equipment designs, Machine parts and design basics	Fundamentals of calculation of car structures, Design of road transport enterprises, Final certification
	KB12	Machinery and equipment for construction				PO7 PO8	The discipline studies general information about construction machines as means of mechanization of construction, their drives, working bodies and running equipment. The questions of the purpose of each type of machines, rational areas of their application are considered, the principles of construction and working processes are described, classification and indexing schemes of construction machines, formulas for calculating productivity are given. Interactive teaching	Hydraulics and hydraulic drive, Machines and mechanisms for earthworks	Mechanization and automation of loading and unloading operations, Modern track and construction machines, Final certification

							methods are used within the discipline		
БД	КВ13	Modern technologies in motor transport	270	9	5	PO7 PO9	Studies the design, principle of operation and basis of technical operation of modern motor vehicles and their aggregates (electric vehicles, hybrid motor vehicles, electric motors, rotary engines, etc.) Within the framework of the discipline, interactive teaching methods, group work, computational and analytical method, discussion are used. The form of assessment is an oral exam	Engineering mathematics, Fundamentals of calculating the strength of machines and mechanisms	Automobile engines, Fundamentals of calculation of automobile structures, Design of automobile transport enterprises
	КВ14	Machines and mechanisms for earthworks				PO7	Studies general information about machines and mechanisms for earthworks, earthmoving machines, earthmoving and transport machines, machines and equipment for compaction of soils, for preparatory, auxiliary and special earthworks, the basics of the device and operation of machines and mechanisms for the production of earthworks, features of work and methods of calculation of operating parameters, methods of using the park of earthmoving machines and increase their productivity. Interactive teaching methods are used within the discipline	Machine parts and design basics, Fundamentals of calculating the strength of machines and mechanisms	Modern track and construction machinery, Mechanization and automation of loading and unloading operations
БД	КВ15	Fundamentals of transport equipment designs	270	9	5	PO8 PO10	Forms knowledge about the devices, purpose, principles of operation of mechanisms and systems of modern cars, which are introduced into the production process. Prepares a high-level specialist who understands the design of aggregates, components and mechanisms of cars, who is able to choose the parameters of cars in order to obtain optimal performance characteristics, analyze and evaluate the impact of the design on the operational properties of the internal combustion engine.	Engineering Mathematics, Applied Physics, Fundamentals of calculating the strength of machines and mechanisms	Automobile engines, Design of automobile transport enterprises
	КВ16	Vehicles				PO8 PO10	Studies the design and principle of operation of vehicles; technical operation; the influence of various factors on changes in traction, energy and operational characteristics of vehicles. The teaching methods are: group work, problem situations, interactive teaching methods. The form of assessment is an oral exam.	Engineering Mathematics, Applied Physics, Structural materials in transport engineering	Fundamentals of calculation of car structures, Modern technologies in motor transport
ПД	КВ17	Basics of calculating car designs	180	6	7	PO8 PO10	Studies the basics of the theory of mechanisms and machines, the resistance of materials, calculation and design of general-purpose parts and assemblies widely	Engineering Mathematics, Applied Physics,	Technical diagnostics of transport

							used in machines to solve problems aimed at improving the reliability, strength and durability of parts and assemblies in design, construction and operation, using modern educational and information technologies. Methods of active learning – performing individual computational and graphical tasks.	Fundamentals of transport equipment designs	equipment, Design of road transport enterprises
	КВ18	Mechanization and automation of loading and unloading operations				РО7	Studies the basics of complex mechanization and automation of loading and unloading operations and warehouse operations in transport; the procedure for choosing the means of mechanization and automation of these works and how to perform them; the theory of calculating the main parameters of loading and unloading machines, as well as for hydraulic, pneumatic and suspended transport. The issues of the basic principles of mechanization and automation of warehouse operations with goods transported by road, as well as methods of transshipment of these goods from narrow gauge to wide gauge, from railway to water transport and back are considered. Interactive teaching methods are used within the discipline.	Hydraulics and hydraulic drive, Fundamentals of Transport Engineering Structures Applied Physics,	Modern track and construction machines, Final certification
ПД	КВ19	Design of road transport enterprises	270	9	8	РО8	To form the necessary set of knowledge of modern methods of technological design of motor transport enterprises, to develop skills and necessary competencies for making and implementing decisions on the design or reconstruction of motor transport enterprises. The discipline covers the study of the following issues: calculation of the technological program of the ATP, SRT, calculation of the number of posts and production lines for maintenance and repair of cars, calculation of the number of repair workers, Calculation of the areas of the main production units of the ATP, SRT, selection of the necessary technological equipment	Fundamentals of transport equipment designs, Fundamentals of computer modeling	Production practice 2, Final certification
	КВ20	Modern track and construction machines				РО7	Studies the designs, theories and calculations of modern track and construction machines, common in road construction, repair and maintenance of the roadbed, ballasting and lifting of the track, cleaning of rubble, assembly, disassembly and laying of the grid, compaction of the ballast prism and soil, straightening and straightening of the track, production of excavation	Machinery and equipment for construction Machinery and mechanisms for excavation work,	Production practice 2, Final certification

							and pile work, as well as control and measuring machines and mechanisms, specialized rolling stock of railway and automobile transport. The method of calculation and selection of the main parameters of the working bodies of modern track and construction machines is given. Interactive teaching methods are used within the discipline.		
ПД	КВ21	Car engines	180	6	6	PO8 PO9	To form the necessary set of knowledge on the design and operation of automobile and tractor engines of various types, the study of the design of mechanisms and engine systems, kinematics and dynamics of movement of the main parts. The discipline covers the study of the following issues: the theory of thermodynamic processes and cycles occurring in heat engines; the study of technical, economic and thermodynamic performance indicators of cycles and engines, methods of obtaining them and methods of increasing; familiarization with the basics of engine control and automation, the principles of design and calculation of the main engine parts.	Fundamentals of calculation of car structures, Power plants of transport equipment	Fundamentals of technical operation of transport equipment, Fundamentals of calculation of car structures, Final certification
	КВ22	Road construction				PO10	Study of the requirements for the railway track depending on the classification of railway lines, structural elements of the upper and lower structures of the railway track, working conditions and deformation of the railway track, standards and tolerances for the maintenance of the rail track, methods of design and calculation of the rail track, transverse profiles of the roadbed and methods of calculating the embankment for stability. The teaching methods are: lecture-press conference, problem solving, thematic colloquiums. Within the framework of the discipline, field classes are provided to the branch of the department and guest lectures by top managers.	Machines and mechanisms for earthworks, Vehicles	Mechanization and automation of loading and unloading operations, Modern track and construction machines
	КВ23	Managerial Economics (Minor 1)	90	3	5	PO4	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 tasks facing the head of the company. The study of this discipline will allow students to obtain and develop knowledge in the field of analytical studies of economic,	Fundamentals of Economics and Entrepreneurship, Fundamentals of Law and Anti-corruption Culture	Final certification

							technological and technical parameters of the enterprise, as well as will allow them to master the skills of applying special methods of economic justification of management decisions and assessing their consequences. Methods of active learning are used - situational tasks, case method.		
	KB24	Time Management (Minor 2)				PO4	Formation of students' general ideas about the essence and types of time management, principles and methods of time resource management for more successful implementation of professional activities. Methods of active learning are used - situational tasks, case method	Fundamentals of Economics and Entrepreneurship, Fundamentals of Law and Anti-corruption Culture	Final certification
	KB25	Transport Logistics (Minor)	90	3	6	PO10	The study of the main provisions of transport support of logistics systems, activities in the field of transportation, covering the entire range of operations and services for the delivery of goods from the manufacturer of products to the consumer, the principles of design and construction of logistics systems. Mastering the skills of optimization and organization of rational cargo flows, their processing in specialized logistics centers, ensuring an increase in their efficiency, reducing unproductive costs and expenses. The teaching methods are: solving problems, conducting thematic colloquiums, seminars "brainstorming". Within the framework of the discipline, guest lectures are conducted by leading specialists of transport and logistics companies.	Vehicles, Fundamentals of computer modeling	Final certification
	KB26	Computer diagnostics of cars (Minor))				PO9	To form the necessary set of knowledge in the field of effective organization of computer diagnostics of the technical condition of cars using modern diagnostic methods based on regulatory and technical documentation for the operation and repair of cars. Within the framework of the discipline, the main diagnostic parameters of car units and systems are studied; existing methods of computer diagnostics of the technical condition of cars; regulatory environmental requirements related to the impact of road transport on the environment; physical bases of applied diagnostic methods, basic diagnostic parameters, types and capabilities of diagnostic equipment	Fundamentals of computer modeling, Fundamentals of transport equipment designs	Final certification

	KB27	Technical Fundamentals of Machine Design (Minor)	90	3	7	PO8	Studies the basic principles and methods of designing track and road vehicles, design documentation, standardization in mechanical engineering, issues of invention and rationalization in the work of the designer, analysis of patent information and scientific and technical literature, technical and economic indicators of machines at the design stage, selection of optimal solutions to improve the quality of machines. Interactive teaching methods are used within the discipline. The form of assessment is a combined examination in the form of an oral and written survey.	Fundamentals of Computer modeling, Fundamentals of Transport Equipment Designs	Final certification
	KB28	Power BI Business Analytics (Minor)				PO2	Formation of students' skills and knowledge to collect, analyze and structure data in order to build interactive dashboards, program at the current level of development of the MDX multidimensional data analysis language, build models and algorithms of projects in relevant areas of BI technology, be able to analyze the essence of the subject field of the project and make decisions. Methods of active learning are used - brainstorming, working in small groups.	Fundamentals of Economics and Entrepreneurship, Engineering Mathematics	Final certification
Total			**1950**	**68**					

Head of the department "ATS&BZHD" **Shingisov B.**