



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



CATALOG OF DISCIPLINES OF THE COMPONENT BY CHOICE

EDUCATIONAL PROGRAM

6B07118 - Travel and road vehicles

Education level: bachelor's degree

Training period: 4 years

Year of admission: 2023

Cycle	Component	Name of the discipline	General labor intensity		Semester	Learning Outcomes	Brief description of the discipline	Prerequisites	Postrequisites
			in academic hours in academic credits	in academic hours in academic credits					
1	2	3	4	5	6	7	8	9	10
GED	CC1	Scientific research methods	150	5	3	LO12	Obtaining theoretical and applied knowledge by students on the methods of scientific research of problems in the field of study, training of specialists with the skills of cognitive activity in the field of science, the formation of 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 certification
	CC2	Ecology and life safety				LO3	The study of the basic environmental concepts, environmental problems and approaches to their solution, sources and types of environmental pollution by enterprises, the principles of standardizing 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).			
	CC3	Basics of law and anti-corruption culture	150	5	3	LO12	Improving the public and individual legal awareness and legal culture of students, as well as the formation of a system of knowledge and civil position to combat corruption as an anti-social 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 the legitimate interests of a person in case of their violation.	Socio-political knowledge module	Managerial Economics, Time Management
	CC4	Basics of economics and entrepreneurship				LO4	He studies the activities of enterprises in various types of markets, the model of equilibrium and functioning of the market, state regulation of prices and tariffs. Considers the concept of entrepreneurship and the limits of its legal regulation, the conditions for the development of entrepreneurship, organizational and legal forms of doing business, business planning, entrepreneurial secrecy, social responsibility of. Active learning methods: case methods; business role-playing games, group work.	Socio-political knowledge module	Managerial Economics, Time Management
	CC5	Fundamentals of calculating the strength of machines and mechanisms	180	6	4	LO5	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.	Engineering mathematics, Structural materials in transport engineering Theoretical mechanics Electrical engineering and the basics of electronics	Machine details and OK Technical basics of creating machines Metrology, standardization and certification
BD	CC6	Applied Mechanics				LO5	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.	Engineering mathematics, Structural materials in transport engineering Theoretical mechanics Electrical engineering and the basics of electronics	Machine details and OK Technical basics of creating machines Metrology, standardization and certification

BD	CC7	Fluid and gas mechanics, hydroand pneumatic drive	180	6	4	LO7 LO10	General laws and equations of hydrodynamics, fluid motion modes and fundamentals of hydrodynamic similarity, laminar and turbulent fluid motion, hydraulic barriers, fluid flow through nozzles and nozzles, hydraulic calculation of pipelines, volumetric hydraulic machines, hydraulic drives and Hydraulic automation, pneumatic drive, pneumatic motor, pumps, hydraulic motors, fans, hydrodynamic transmission, hydraulic drive drives are metal-cutting tools. Teaching methods: problem solving, conducting thematic surveys, open and closed tests.	Engineering mathematics, Structural materials in transport engineering Theoretical mechanics Electrical engineering and the basics of electronics	Machine details and OK Technical basics of creating machines Metrology, standardization and certification Lifting and transport machines Reliability of transport equipment
	CC8	Heat engineering				LO7 PO10	Studies the basics of obtaining, converting, transferring and using heat, thermodynamic cycles of heat engines and calculation of their parameters, types of heat exchange, heat exchangers and methods of their calculation, the principle of operation and design features of heat-power, heat-using machines, aggregates and devices. The discipline contributes to the analysis of energy-saving technology in transport and the determination of trends in the development of heat-engineering machines, equipment, installations and devices.	Engineering mathematics, Structural materials in transport engineering Theoretical mechanics Electrical engineering and the basics of electronics	Machine details and OK Technical basics of creating machines Metrology, standardization and certification Lifting and transport machines Reliability of transport equipment
BD	CC9	Design of metal structures for track and road vehicles	180	6	7	LO8 LO10	Studies the principles and types of design of metal structures of track and road vehicles, the main sections of metal structures, requirements for basic materials of metal structures, methods of calculation of metal structures, elements of metal structures, design of sheet and lattice structures, design of beam and frame type structures. The teaching methods are: problem solving, calculation and design method, conducting thematic colloquiums.	Machines for earthworks Reliability of transport equipment Complex mechanization of loading and unloading operations	Travel and road vehicles, Operation of track and road vehicles Production practice 2 Final certification
	CC10	Crushing, sorting and grinding equipment				LO8 LO10	The discipline studies the types and classification of grinding machines, machines for crushing and grinding stone materials, machines for sorting and washing stone materials, the main parameters of the grinding process, the design of varieties of crushers, screens and dispensers. Interactive teaching methods are used within the discipline.	Machines for earthworks Reliability of transport equipment Complex mechanization of loading and unloading operations	Travel and road vehicles, Operation of track and road vehicles Production practice 2 Final certification

BD	CC11	Complex mechanization of loading and unloading operations	270	9	6	LO10	Considers general information on the complex mechanization of loading and unloading operations, the choice of means of mechanization and handling of loading and unloading operations; the choice of options for complex mechanization and automation of cargo processing, the main types of devices and work processes of machines designed for complex mechanization of loading and unloading and storage operations in transport. Interactive teaching methods are used within the discipline.	Energy installations of transport equipment Lifting and transport machines Metrology, standardization and certification	Construction machines Track and road machines Operation of track and road vehicles
	CC12	Reliability of transport equipment				LO5	The distribution of the causes of changes in the technical condition of transport equipment, problems of reliability of transport equipment and its properties, ensuring the reliability of motor vehicles, functional and quantitative indicators of reliability of technical elements and systems, tasks for predicting the condition of machines, its diagnostics, ensuring the operability of machines, the basic laws of resource allocation and calculations of reliability indicators of machines Studies the definition of the parameters of the law. Interactive teaching methods are used within the discipline.	Energy installations of transport equipment Lifting and transport machines Metrology, standardization and certification	Construction machines Track and road machines Operation of track and road vehicles
BD	CC13	Lifting and transport machines	270	9	5	LO8 LO10	Considers general information about lifting and transport machines, their parts and assembly units, lifting and transporting machines, general devices and work processes, design and operational characteristics, the basics of the methodology for selecting braking and stopping devices, the methodology for selecting engines, gearboxes, lifting devices. The discipline uses interactive teaching methods, open and closed tests.	Applied physics, Machine parts and OK, Fundamentals of strength calculation of machines and mechanisms, Electrical Engineering and fundamentals of electronics	Machines for earthworks, Design of metal structures for track and road vehicles Travel and road vehicles
	CC14	Metrology, standardization and certification				LO7	The discipline studies the importance and role of standardization, metrology and certification in the field of transport equipment, systems of units of physical quantities, the state system for ensuring the uniformity of measurements, measurement methods and means, standards and verification schemes, metrological characteristics of measuring instruments, the structure and tasks of the state metrological service, the organization of verification activities, evaluation and indicators of product quality, stages and prospects for the	Applied physics, Machine parts and OK, Fundamentals of strength calculation of machines and mechanisms, Electrical Engineering and fundamentals of electronics	Machines for earthworks, Design of metal structures for track and road vehicles Travel and road vehicles

							development of standardization, the state system of standardization, normative documents on international standardization, certification systems, state and industry standardization. Interactive teaching methods are used within the discipline.		
BD	CC15	Fundamentals of automated design of track and road vehicles	270	9	4	LO9	The study of the methodology of computer-aided design; automation of design engineering; the main issues of computer-aided design systems are considered: structure, principles of construction, technical means, information and projection support, focused on the design of objects of track and road machines, training in practical work with the creation of 3D models of machine components with modern CAD using computer technologies (AutoCAD, Solid Works etc.) and 3D printing. Interactive teaching methods - game methods.	Engineering mathematics, Structural materials in transport engineering Theoretical mechanics Electrical engineering and the basics of electronics	Machine details and OK Technical basics of creating machines Metrology, standardization and certification Complex mechanization, automation and mechano-equipment of road construction
	CC16	Technology and mechanization of loading and unloading operations				LO10	Studies the technology of loading and unloading operations on transport, types and designs of loading and unloading machines, equipment, pneumatic, hydraulic and suspended transport, the theory of their calculation, methods of determining the main indicators for the selection of types of technologies in the design of complex mechanization and automation of loading and unloading operations and warehouse operations, technological processes with the main cargo transported by rail. Interactive teaching methods are used within the discipline.	Engineering mathematics, Structural materials in transport engineering Theoretical mechanics Electrical engineering and the basics of electronics	Machine details and OK Technical basics of creating machines Metrology, standardization and certification Complex mechanization, automation and mechano-equipment of road construction
PD	CC17	The mechanical equipment of the enterprises of road economy	180	6	5	LO8 LO10	The basic information about the purpose, scope, device, working processes and technological capabilities of mechanical equipment used in the road sector, general information about crushed materials and grinding machines, about machines for sorting and washing stone materials, machines for working with concrete and mortar, machines for working with asphalt concrete pavement is presented. Interactive teaching methods are used within the discipline.	Applied Physics, Machine Parts and design basics Fundamentals of calculating the strength of machines and mechanisms, Electrical Engineering and fundamentals of electronics	Machines for earthworks, Design of metal structures for track and road vehicles Travel and road vehicles
	CC18	Technical basics of creating machines				LO5 LO9	Studies the basic principles and methods of designing track and road machines, design documentation, standardization in mechanical engineering, issues of invention and rationalization in the work of the designer, analysis of patent	Applied Physics, Machine Parts and design basics Fundamentals of calculating the strength	Machines for earthworks, Design of metal structures for track and road vehicles Travel and road vehicles

							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.	of machines and mechanisms, Electrical Engineering and fundamentals of electronics	
PD	CC19	Operation of track and road vehicles	180	6	8	LO8 LO10	The discipline studies the main provisions and indicators of reliability of transport equipment, operation and maintenance of machines for the repair of the roadbed, control of the condition of parts and assemblies of machines, the theory of work processes, design and methodology for calculating the main parameters of track and road machines, planning of operation, maintenance of machines, technology for the introduction into operation of complexes of machines for repair, current the content of the operated path. Interactive teaching methods are used within the discipline.	Energy installations of transport equipment Lifting and transport machines Construction machines for earthworks	Production practice 2 Final certification
	CC20	Complex mechanization, automation and mechanical strength of road construction				LO9 LO10	The discipline studies the rules and methods of developing design solutions for complex mechanization and automation of construction works based on a systematic approach, extensive use of economic and mathematical methods, modeling and application of electronic computers, technological operations, processes of mechanization, automation and mechanical strength of road construction. Interactive teaching methods are used within the discipline.	Energy installations of transport equipment Lifting and transport machines Construction machines for earthworks	Production practice 2 Final certification
PD	CC21	Construction of a railway track	180	6	6	LO8	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.	Energy installations of transport equipment Lifting and transport machines Metrology, standardization and certification	Construction machines Track and road machines Operation of track and road vehicles Production practice 2

	CC22	Construction of highways				LO8	Familiarization with the technology construction of highways and airfields, methods of control to ensure production, management of technological processes that meet the requirements of standards and regulatory documents, development of technical documentation on compliance with technologies during the construction and operation of transport facilities. Within the framework of the discipline, interactive teaching methods, computational and analytical method are used.	Energy installations of transport equipment Lifting and transport machines Metrology, standardization and certification	Construction machines Track and road machines Operation of track and road vehicles Production practice 2
PD	CC23	Managerial Economics (Minor)	90	3	6	LO4	Formation of the conceptual apparatus and development of economic analysis skills using modern models and laws of economic science, consideration of economic problems and tasks facing the head of the company. The study of this discipline will allow students to gain and develop knowledge in the field of analytical research of economic, technological and technical parameters of an enterprise, and will also allow them to master the skills of applying special methods of economic justification of management decisions and assessing their consequences. Active learning methods are used - situational tasks, case method.	Fundamentals of economics and entrepreneurship, Fundamentals of law and anti-corruption culture	Final certification
	CC24	Time - management (Minor)				LO4	Formation of students' general ideas about the essence and types of time management, principles and methods of time resource management for more successful professional activities. Active learning methods are used - situational tasks, case method.	Fundamentals of economics and entrepreneurship, Fundamentals of law and anti-corruption culture	Final certification
PD	CC25	Transport logistics (Minor)	90	3	7	LO10	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	Machines for earthworks Reliability of transport equipment Complex mechanization of loading and unloading operations	Managerial economics Travel and road vehicles, Production practice 2 Final certification

							lectures are conducted by leading specialists of transport and logistics companies.		
	CC26	Modern travel and road vehicles (Minor)				LO10	Studies the designs, theories and calculations of modern track and road 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 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 road machines is given. Interactive teaching methods are used within the discipline.	Machines for earthworks Reliability of transport equipment Complex mechanization of loading and unloading operations	Operation of track and road vehicles, Track and road vehicles, Production practice 2 Final certification
PD	CC27	Resource saving in transport (Minor)	90	3	8	LO10	The study of the main types and characteristics of energy resources, regulatory and legal support for energy conservation, improving the energy efficiency of the transportation process; energy-saving technologies in repair production and operation of transport infrastructure facilities; organization and methods of energy conservation management. They are used to solve problems, conduct thematic colloquiums, debates. Guest lectures are being held by leading experts of the transport and communication industry.	Machines for earthworks Reliability of transport equipment Complex mechanization of loading and unloading operations	Production practice 2 Final certification
	CC28	PowerBI Business Analytics (Minor)				LO2	Formation of students' skills and knowledge to collect, analyze and structure data in order to build interactive dashboards, program at the modern 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 project subject field and make decisions. Methods of active learning are used - brainstorming, working in small groups.	Fundamentals of Economics and Entrepreneurship, Fundamentals of Law and Anti-corruption Culture	Final certification
Total:			2310	71					

Head of the department "ATS&BZHD"



Shingisov B.