



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



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

**CATALOG OF DISCIPLINES OF THE COMPONENT BY CHOICE**

**EDUCATIONAL PROGRAM**

**6B07119 - CARS AND AUTOMOTIVE INDUSTRY**

**Education level: bachelor course**

**Duration of study: 4 years**

**Year of admission: 2023**

Cycle	Component	Name of the discipline	Total labor intensity		Term	Learning outcomes	Brief description of the discipline	Prerequisites	Post-requirements
			in academic hours	in academic credits					
1	2	3	4	5	6	7	8	9	10
GED	CC1	Ecology and life safety	150	5	3	LO2	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 regulating 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
	CC 2	Methods of scientific research				LO 11	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. Methods of active learning - Group, scientific discussion, debate, project method		

	CC 3	Fundamentals of economics and entrepreneurship				LO 2	Formation of analytical thinking skills in the implementation of conclusions on economic issues; the ability to independently draw conclusions based on the studied material; navigate in any economic situations, apply theoretical economic knowledge in practice, realize their abilities, both personally and professionally. Methods of active learning - business and role-playing games	Socio-political knowledge module	Managerial Economics, Time Management
	CC 4	Fundamentals of law and anti-corruption culture				LO 12	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. Methods of active learning - analysis of specific situations, brainstorming	Socio-political knowledge module	Managerial Economics, Time Management
BD	CC 5	Fundamentals of calculating the strength of machines and mechanisms	180	6	4	LO 5	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.	Structural materials in transport engineering, Theoretical mechanics	Machine parts and design basics, Modern technologies in motor transport, Basics of calculating car designs
	CC 6	Applied mechanics				LO 5	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.	Structural materials in transport engineering, Theoretical mechanics	Machine parts and design basics, Modern technologies in motor transport, Basics of calculating car designs
BD	CC 7	Fluid and gas mechanics, hydraulic and pneumatic drive	180	6	4	LO 7, LO 10	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	Structural materials in transport engineering, Theoretical	Machine parts and design basics, Car construction,, Basics of

							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.	mechanics	calculating car designs
	CC 8	Heat engineering				LO 7, LO 10	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.	Structural materials in transport engineering, Theoretical mechanics	Machine parts and design basics, Car construction,, Basics of calculating car designs
BD	CC 9	Auto-operational materials	180	6	7	LO 10	To form the necessary set of knowledge to classify the main properties, brands and quality indicators of automotive performance materials from the entire range of performance materials. Within the framework of the discipline, automotive fuels are studied; automotive lubricants; automotive special fluids; structural and repair materials; properties, brands and quality indicators of automotive operating materials; selection of a specific brand of fuel, oil, technical fluid from the entire range of operational materials for a specific type and brand of car; selective repair materials that ensure high quality of repair work and assessment of the consequences of the use of substandard operational materials.	Structural materials in transport engineering, Theoretical mechanics, Machine parts and design basics	Technological design of motor transport enterprises, Fundamentals of technical diagnostics of cars, Vehicle safety
	CC 10	Licensing and certification of motor transport activities				LO 10	To form the necessary set of knowledge for the classification of the main provisions of certification and licensing of motor transport activities for the selection of mechanisms of state regulation in the field of car operation. Within the framework of the discipline, the following issues are studied: the basic principles of product certification systems; international and national product certification systems; car certification systems; tasks of planning and carrying out works on certification in motor transport using the current regulatory framework and modern methods and information technologies; legal bases of licensing activities in motor transport; types of licenses and documentation related to its receipt.	Тайм-менеджмент, Транспортная логистика, Транспортная техника и средства механизации	Technological design of motor transport enterprises, Fundamentals of technical diagnostics of cars, Vehicle safety
BD	CC 11	Design and calculation of	180	6	6	LO 8	Develops practical skills and the ability to work with the device of electronic engine control systems, basic	Structural materials in	Fundamentals of calculation of

		automobile engines					circuits for switching on electrical equipment elements, electronic ignition systems, fuel and air supply systems. Develops skills in the use of diagnostics of electronic car systems, the use of electronic auxiliary devices and systems, knowledge of methods of assessment and quality control in professional activities.	transport engineering, Theoretical mechanics, Machine parts and design basics	car structures, Technical operation of cars, Auto-operational materials
	CC 12	Technologies of maintenance and current repair of cars				LO 8	Studies the basics of effective operation of cars; methods of improving the quality of operation of the car fleet; technology of maintenance and repair of cars; organization and methods of maintenance and repair of cars. The discipline uses interactive teaching methods, error detection method, group work, computational and analytical method, discussion.	Structural materials in transport engineering, Theoretical mechanics, Machine parts and design basics	Fundamentals of calculation of car structures, Technical operation of cars, Auto-operational materials
BD	CC 13	Modern technologies in motor transport	270	9	5	LO 6, LO 9	Forms a set of knowledge about the role of electrical equipment for reliable and efficient operation of the car, about electronic devices of vehicles, about the rules for measuring the parameters of electronic circuits. Analyzes progressive methods and means of diagnosing the technical condition and restoring the operability of electrical equipment systems. Forms the skills and abilities of building electronic circuits on integrated circuits, experience in the development of electronic control systems on rigid and flexible logic circuits.	Structural materials in transport engineering, Theoretical mechanics, Machine parts and design basics	Theory of operational properties of cars, Fundamentals of technology of production and repair of cars, Fundamentals of design and operation of technological equipment of automobile enterprises
	CC 14	Electrical and electronic equipment of cars				LO 6, LO 9	To assist in the development of knowledge about the theoretical foundations and principles of operation of systems, components, elements of electronic systems in general motor transport. Develops the ability to read electrical circuits of electrical equipment and electronic systems of cars; analyze circuits, components and elements of electronic systems of cars, evaluate their technical level. Instills practical skills to identify malfunctions of components and elements of electrical equipment and electronic systems of the car, to use control and measuring equipment.	Electrical engineering and fundamentals of electronics, Structural materials in transport engineering, Theoretical mechanics,	Theory of operational properties of cars, Power plants of transport equipment, Fundamentals of design and operation of technological equipment of automobile enterprises

BD	CC 15	Car construction	270	9	5	LO 8	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.	Structural materials in transport engineering, Theoretical mechanics, Machine parts and design basics	Theory of operational properties of cars, Fundamentals of calculation of car structures, Fundamentals of technical diagnostics of cars
	CC 16	Transport equipment and means of mechanization				LO 8	The discipline studies the principles of operation, design features of transport equipment and means of mechanization, basic technical, operational, traction and energy characteristics, the role and significance of technical operation of various types of transport equipment. Within the framework of the discipline, interactive teaching methods are used, thematic surveys are conducted	Structural materials in transport engineering, Theoretical mechanics, Machine parts and design basics	Theory of operational properties of cars, Fundamentals of calculation of car structures, Fundamentals of technical diagnostics of cars
PD	CC 17	Fundamentals of car manufacturing and repair technology	180	6	5	LO 9	To form the necessary set of knowledge to evaluate modern technologies for the production and repair of cars using progressive methods of repairing damaged parts based on regulatory and technical documentation for the operation and repair of cars. Within the framework of the discipline, the technologies of production and repair of cars are studied; technological processes of manufacturing car parts; modern methods of restoring parts; repair methods for various types of destruction; calculation and design of production and repair of cars using modern information technologies, methods and design tools; basic regulatory and technical documentation for car repair.	Structural materials in transport engineering, Theoretical mechanics, Machine parts and design basics	Theory of operational properties of cars, Fundamentals of calculation of car structures, Technical operation of cars
	CC 18	Mechanical engineering technology				LO 9	Mastering students' knowledge in the field of production technology of machine repair. The study of the following issues is also considered: technological processes of manufacturing machine parts; modern methods of restoring parts; repair methods for various types of destruction; calculation and design of processes of production and repair of machines using modern information technologies; methods and means of design;	Structural materials in transport engineering, Theoretical mechanics, Machine parts and design basics	Theory of operational properties of cars, Fundamentals of calculation of car structures, Technical

							basic regulatory and technical documentation for the repair of machines. Interactive teaching methods are used within the discipline.		operation of cars
PD	CC 19	Fundamentals of technical diagnostics of cars	270	9	8	LO 9	To form the necessary set of knowledge about the types of technical diagnostics of cars as a whole and its aggregates; about the types of technical means of diagnosis; technological support for diagnostics; the ability to diagnose the condition of cars using the necessary methods and means of analysis; to determine the need for adjustment or repair actions. The discipline uses interactive teaching methods, group work, problem situations, discussion.	Theory of operational properties of cars, Fundamentals of calculation of car structures, Technical operation of cars	Production practice 2, Final certification
	CC 20	Vehicle safety				LO 9, LO 10	The discipline considers general issues of vehicle safety, active and passive, post-accident and environmental safety, parameters and operational properties, design features of vehicles that directly affect their traffic safety, issues of regulatory safety of vehicles, stability and informativeness, ergonomic properties of vehicles. The discipline uses interactive teaching methods, open and closed tests.	Theory of operational properties of cars, Fundamentals of calculation of car structures, Technical operation of cars	Production practice 2, Final certification
PD	CC 21	Fundamentals of design and operation of technological equipment of the automobile enterprise	270	9	6	LO 8, LO 10	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, computational and analytical method using AutoCAD computer programs, situational tasks, discussion are used.	Machine parts and design basics, Modern technologies in motor transport, Car construction	Licensing and certification of motor transport activities, Technical operation of cars, Technological design of motor transport enterprises
	CC 22	Operation of technological machines and equipment				LO 8, LO 10	Studies the general principles and methods of operation of technological machines and equipment; repair systems and maintenance of technological equipment. Theoretical and practical issues of purpose, principles of operation of technological machines and equipment used in car maintenance and repair are considered. As part of the study of the discipline, interactive teaching methods, computational and analytical method, situational tasks,	Machine parts and design basics, Modern technologies in motor transport, Car construction	Licensing and certification of motor transport activities, Technical operation of cars, Technological

							discussion are used.		design of motor transport enterprises
PD	CC 23	Managerial economics (Minor 1)	90	3	5	LO 11	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, 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	Fundamentals of Economics and Entrepreneurship, Fundamentals of Law and Anti-corruption Culture	Final certification
	CC 24	Time Management (Minor 2)				LO 11	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
PD	CC 25	Transport logistics (Minor 3)	90	3	5	LO 10	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.	Fundamentals of Economics and Entrepreneurship, Fundamentals of Law and Anti-corruption Culture	Licensing and certification of motor transport activities, Power BI Business Analytics, Vehicle safety
	CC 26	Computer diagnostics of cars (Minor 4)				LO 9	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	Information and communication technologies, Fundamentals of computer modeling	Design and calculation of automobile engines, Fundamentals of technical diagnostics of

							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		cars
PD	CC 27	Resource conservation in transport (Minor 5)	90	3	7	LO 10	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.	Fundamentals of economics and entrepreneurship, Methods of scientific research	Technological design of motor transport enterprises, Technical operation of cars, Final certification
	CC 28	Power BI Business Analytics (Minor 6)				LO 1	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, Methods of scientific research	Technological design of motor transport enterprises, Technical operation of cars, Final certification
<b>Total</b>			<b>2400</b>	<b>80</b>					

Head of the department "ATS&BZHD"



Shingisov B.