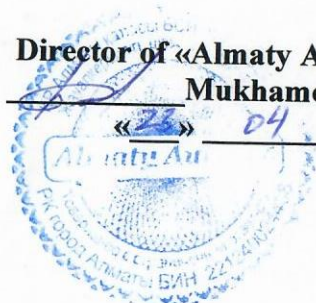


AGREED
Director of «Almaty Auto KZ» LLP
Mukhamedzhanov B.E.
«23» 04 2024 y.



APPROVE
Director of the Institute
of «Transport Engineering»
«ҚОЛІК ИНЖЕНЕРЛІГІ» ИНСТИТУТЫ
Abdreshov Sh.A.
«23» 04 2024 y.

CATALOG OF DISCIPLINES OF THE COMPONENT BY CHOICE

EDUCATIONAL PROGRAMS

6B07138-Mechanical engineering

Education level: Bachelor's degree

Duration of study: 4 years

Year of admission: 2024

Cycle	Component	Name of the discipline	Total labor intensity		Term	Learning outcomes	Brief description of the discipline	Prerequisite s	Post-requirements
			in academic hours	in academic credits					
1	2	3	4	5	6	7	8	9	10
GES	component of choice	Ecology and Railways	150	5	5	ON6	The discipline provides knowledge and ideas about environmental problems and approaches to solving them, sources and types of environmental pollution by enterprises, principles of rationing the quality of atmospheric air and water, the main provisions of legislation in various fields, on 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
	component of choice	Methods of scientific research				ON3	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 the students on the methods of scientific research of problems in the studied area, instills in future specialists the skills of cognitive activity in the field of science. Methods of active learning - group, scientific discussion, debate, project method.	Socio-political knowledge module	Operation and repair of technological equipment Design and production of blanks, IA

	component of choice	Economics and business activities				ON7	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, the conditions for the development of entrepreneurship, organizational and legal forms of doing business, business planning, business secrecy, social responsibility of entrepreneurship.	Socio-political knowledge module	Managerial Economics, Time management
	component of choice	Fundamentals of law and anti-corruption culture				ON3	The discipline outlines the fundamental concepts of law, the constitutional structure of 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 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. Methods of active learning - analysis of specific situations, brainstorming.	Socio-political knowledge module	Fundamentals of interchangeability, Reliability of engineering structures
BD	component of choice	Fundamentals of calculating the strength of machines and mechanisms	180	6	4	ON2	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 are the performance of individual computational and graphical tasks.	Theoretical mechanics Electrical engineering and the basics of electronics	Digital manufacturing and additive technologies Machine parts and design basics Methods of mechanical processing of materials
	component of choice	Applied Mechanics				ON2	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. The methods of active learning are the performance of individual computational and graphical tasks.	Theoretical mechanics Electrical engineering and the basics of electronics	Digital manufacturing and additive technologies Machine parts and design basics Methods of mechanical processing of materials

BD	component of choice	Hydraulics and hydraulic drive	180	6	3	ON5	Studies the general laws and equations of fluid dynamics, modes of fluid motion and the basics 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 hydraulic machines. The teaching methods are: problem solving, conducting thematic surveys, open and closed tests.	Engineering Mathematics 1-2, Applied Physics 1-2, Structural materials in transport engineering	Lifting and transport machines, Mechanical engineering technology Applied Mechanics
	component of choice	Tribotechnics				ON5	Studies the basic concepts of contacting and friction of contacting 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 1-2, Applied Physics 1-2, Structural materials in transport engineering	Lifting and transport machines, Mechanical engineering technology Applied Mechanics
BD	component of choice	Mechanical engineering technology	180	6	7	ON4	The discipline studies the patterns of technological processes at the final stages of machine production, namely: in the machining of parts and assembly of machines, as well as ways to use these patterns to ensure the required quality of machines and their lowest cost. In mechanical engineering technology, issues of interaction between a machine tool, an installation device, a working tool and a workpiece are also comprehensively studied.	Cutting tools Basics of interchangeability The criterion of strength and reliability of structures	Fundamentals of engineering enterprises design Design of technological processes for machine tools Final certification
	component of choice	Technological processes in mechanical engineering				ON4	The discipline studies the technological processes of procurement production, the acquisition of theoretical and practical knowledge of the basic methods and methods of obtaining blanks in mechanical engineering. As a result, students acquire practical skills in choosing methods for obtaining blanks, depending on the material of the workpiece and the requirements of machine production:	Cutting tools Basics of interchangeability The criterion of strength and	Fundamentals of engineering enterprises design Design of technological

							casting methods, pressure treatment of materials, welding methods, plasma and laser cutting.	reliability of structures	processes for machine tools Final certification
BD	component of choice	Criteria for strength and reliability of structures	180	6	6	ON4 ON8	He studies classical strength theories, methods for evaluating the strength of typical machine-building structures, criteria for the strength of composite materials, calculations of mechanical reliability indicators of machine-building structures, solving problems of structural operability under dynamic loading. Interactive teaching methods are used within the discipline.	Lifting and transport mechanisms and machines Reliability of engineering structures	Design and production of blanks Computer-aided design systems in mechanical engineering
	component of choice	Operation and repair of technological equipment				ON4	Studies the following issues: basic principles of equipment operation; operational documentation of equipment; features of operation of modern types of equipment; causes of failures and malfunctions of components and parts of equipment; methods for detecting defects in parts and assemblies and methods, tools and equipment for restoring parts and assemblies; organization of equipment repair in production. Interactive teaching methods are used within the framework of the discipline.	Lifting and transport mechanisms and machines Reliability of engineering structures	Design and production of blanks Computer-aided design systems in mechanical engineering
BD	component of choice	Methods of mechanical processing of materials	180	6	5	ON4	Studies the rational choice of machining methods for various configurations and materials of workpieces in mechanical engineering, classification of surface machining methods, basic principles, equipment and tooling used in various types of machining. The methods of active learning are the performance of individual calculation and graphic works.	Engineering Mathematics 1,2 Electrical Engineering and Basics Electronics Fundamentals of calculating the strength of machines and mechanisms	Operation and repair of technological equipment Criteria for strength and reliability of structures Metal cutting machines
	component of choice	Cutting theory				ON4 ON11	He studies the basics of the theory of metal cutting, thermophysics and dynamics of the cutting process, the main technological methods of cutting, the definition and	Engineering Mathematics 1,2	Operation and repair of

							calculation of the main modes of material processing, the determination of optimal cutting modes, the choice of required cutting parameters for ferrous and non-ferrous metals, the use of normative materials, reference and technical documentation. Methods of active learning are the performance of individual computational and graphical tasks.	Electrical Engineering and Basics Electronics Fundamentals of calculating the strength of machines and mechanisms	technological equipment Criteria for strength and reliability of structures Metal cutting machines
BD	component of choice	Metrology and technical measurements	180	6	4	ON8	Examines the values and roles of standardization, metrology and certification in mechanical engineering, systems of units of physical quantities, the state system for ensuring the uniformity of measurements, measurement methods and tools, standards and verification schemes, metrological characteristics of measuring instruments, the structure and tasks of the state metrological service, the organization of verification activities, assessment and indicators of product quality, stages and prospects for the 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 framework of the discipline.	Engineering Mathematics 1,2 Applied Physics 1,2	Methods of mechanical processing of materials Cutting tools Machine parts and design basics
	component of choice	Basics of interchangeability				ON8	He studies the basics of interchangeability and standardization, the relationship between the quality of products and their production with interchangeability, the principles of interchangeability, systems of tolerances and landings of standard joints, calculations and rationing of standard joints, design and calculation of landings, competent design documentation, methods of interchangeability in solving technical problems. Interactive teaching methods are used within the framework of the discipline.	Engineering Mathematics 1,2 Applied Physics 1,2	Methods of mechanical processing of materials Cutting tools Machine parts and design basics
PD	component of choice	Fundamentals of engineering enterprises design	180	6	8	ON11	Considers the methodology and practice of designing machine-building workshops, sites for various types of production, planning of production and service sites by performing site planning, classification of transport, including in-shop facilities of machine-building enterprises;	Design and production of blanks Computer-aided design	Final certification

							functions of the transport service of enterprises; types of external and internal transport of enterprises; methods of mechanization and automation of in-shop transport. Interactive teaching methods are used within the framework of the discipline.	systems in mechanical engineering Digital manufacturing and additive technologies	
	component of choice	Design and calculation of technological equipment				ON7	Studies the elements of devices, their purpose and design methods, selection of types and structures of devices, their necessary calculations, methods of designing technological equipment and tools, execution of drawings using computer technology in the AutoCAD system. Interactive teaching methods are used within the framework of the discipline.	Design and production of blanks Automatic design systems in mechanical engineering Digital manufacturing and additive technologies	Final certification
PD	component of choice	Automation of production processes and robotics	270	9	8	ON1 ON11	Studies the devices and design of machine tools for installing and fixing workpieces, the stages and methods of their design, methods of using various types of devices for metal-cutting machines, the execution of drawings using computer technology in the AutoCAD system. Within the framework of the discipline, interactive teaching methods and the computational and graphical method are used.	The basics of artificial intelligence Computer-aided design systems in mechanical engineering Digital manufacturing and additive technologies	Final certification
	component of choice	Design of technological processes for machine					Studies methods of designing and programming technological processes of machining parts on CNC machines, methods and means of developing technological processes and developing control programs for machining parts on CNC machines, the possibilities of modern computer technology and CAD/CAM systems. Within the	The basics of artificial intelligence Computer-aided design systems in	Final certification

							framework of the discipline, interactive teaching methods and the computational and graphical method are used.	mechanical engineering Digital manufacturing and additive technologies	
PD	component of choice	tools Metal cutting machines	180	6	6	ON5	Studies the basics and principles of operation of metal-cutting machines, classifications, kinematic schemes of machines, principles of their operation, degrees of automation of machines, methods of selecting metal-cutting machines to perform specific technological operations, including with the help of reference literature, methods for determining the accuracy standards of the machine, functional and technological possibilities of using machines for the production of machine parts. Interactive teaching methods are used within the framework of the discipline.	Cutting theory Methods of mechanical processing of materials Metrology and technical measurements	Mechanical engineering technology Design and production of blanks Design and calculation of technological equipment
	component of choice	Cutting tools				ON11	Studies the types of cutting machines, varieties of their designs, components, technological capabilities; features of the designs and operation of cutting machines used in automated systems; structural and geometric parameters of cutting machines; directions for improving the designs of cutting machines. The methods of training are performing calculations and applying them in practice.	Cutting theory Methods of mechanical processing of materials Metrology and technical measurements	Mechanical engineering technology Design and production of blanks Design and calculation of technological equipment
PD	component of choice	Managerial economics	90	3	5	ON7	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. Studying this discipline will allow students to acquire and develop knowledge in the field of analytical studies of economics, technological and technical parameters of enterprises, as well as to master the skills of applying special methods of economic justification, management decisions and assessing their consequences.	Basic school knowledge of economics	Design and production of blanks Design and calculation of technological equipment Final certification

	component of choice	Time management				ON7	Formation of students' general ideas about the essence and types of time management, principles and methods of time resource management for more effective implementation of professional activities.	Engineering Mathematics 1,2	Design and production of blanks Design and calculation of technological equipment
PD	component of choice	Critical thinking	90	3	5	ON7	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.	Psychology Sociology Cultural studies	Philosophy Design and calculation of technological equipment Final certification
	component of choice	Fundamentals of financial literacy				ON7	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	Design and production of blanks Design and calculation of technological equipment Final certification
Total:			2040	68					

Acting head of the department
«Motor vehicles and safety of life»



Naimanova G.T.