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S.Seifullin Kazakh AgroTechnical University

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Council of the University
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APPROVED BY
Deputy Chairman of the Board
for Academic Affairs – Rector
"Kazakh Agrotechnical
S.Seifullin University"
A.M.Abdyrov
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EDUCATIONAL PROGRAM

6B07111 Technical service of motor vehicles (master of industrial training)

Code and classification of the field of education: 6B07 Engineering, manufacturing and construction industries

Code and classification of training areas: 6B071 Engineering and Engineering affair

Group of educational programs B065 Motor vehicles

Duration of study: 4 years

Form of study: full-time

Language of instruction: Kazakh, Russian, multilingual

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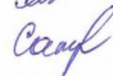
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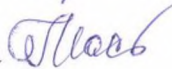
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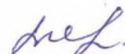
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The educational program 6B07111 Technical service of motor vehicles (master of industrial training) was considered at the meeting of the Department of "Professional Education"

" 6 " 18.11 2022, protocol № 6

It is recommended at a meeting of the of "Computer Systems and Professional Education" Faculty Council

" 18 " 11 2022, protocol № 6

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1 Passport of the educational program

1.1 Purpose of the educational program

№	Fieldtitle	Note
1	The code of the educational program	6B07111
2	Code and classification of the field of education	6B07 Engineering, manufacturing and construction industries
3	Code and classification of the direction of training	6B071 Engineering
4	Name of the educational program	Technical service of motor vehicles (master of industrial training)
5	Type of EP	New EP;
6	Goal of EP	Preparation of highly qualified masters of industrial training, possessing professional competencies and personal qualities, capable of carrying out professional activities on the basis of technical, psychological and pedagogical disciplines and modern standards in this field of bachelor's training in the profile of Technical service of motor vehicles (master of industrial training).
7	Level NQF	6
8	Level IQF	6
9	Learning outcomes	LO1 Analyze the features of social, political, cultural, psychological institutions in the context of their role in the modernization of Kazakh society, as well as systematize knowledge about the essence and forms of

manifestation of economic and legal phenomena and processes;

LO 2 Possess the skills of pedagogical communication and methods of managing an individual and a group, monitoring the course of mental development of students at various levels of education, as well as master the basics of technical systems;

LO 3 Using the basics of natural science knowledge and methodology to identify production problems and solve professional tasks;

LO 4 Using languages to gain additional professional knowledge and form professionally significant personality traits;

LO 5 Reading types of design documentation and execute drawings, diagrams in accordance with the requirements of the unified system of design documentation standards, use computer programs for drawing up drawings;

Perform work on the basis of labor legislation and in accordance with the rules and regulations of labor protection, safety, industrial sanitation and fire protection;

LO 6 Perform calculations of elements in the structure for strength, rigidity, stability based on the laws of statistics, kinematics and dynamics;

Design parts, assemblies and mechanisms.

LO 7 Using and carry out diagnostics of electrical, electrical machines and apparatuses, electronic equipment; Select types of devices for quality control and quality management of parts and assemblies of aggregates and machines;

LO 8 To operate modern machines and equipment, motor vehicles to design technical service enterprises. To determine the features of the technology of the industry and a separate specialty in it; To carry out professional activities for the technical service of vehicles;

LO 9 Being able to manage the educational process, develop educational and program documentation and use them to form the content of education,

		<p>conduct educational work with students; LO 10 To form the skills of research activity students LO 11 Being able to conduct industrial training classes in accordance with the branch of training students, conduct industrial training classes using modern training technologies, form professional knowledge and skills among students, monitor training at various stages of vocational training.</p>
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The objectives of the educational program 6B07111 Technical service of motor vehicles (master of industrial training) are:

- formation of graduates' competencies necessary for the implementation of professional activities according to the direction of Technical service of motor vehicles (master of industrial training);

- formation of students' knowledge and skills in the application of technical disciplines and specialized knowledge for the organization of safe work during maintenance and repair of motor transport, for the development of design and technological documentation, for the repair of modernization and modification of vehicles, for the implementation of technical control of products and services and ensuring safety at the production site.

- formation of necessary competencies based on the study of psychological and pedagogical disciplines for decision-making in their professional activities, for the development of programs and the creation of mechanisms for improving and developing the educational process in college, ensuring the effectiveness of professional activity;

- formation of the ability to acquire new knowledge, psychological and pedagogical readiness to change the type and nature of their professional activities and providing graduates with the opportunity to continue their education;

- providing the variety of educational opportunities for students, the possibility of choosing an individual education program;

After successful completion of this educational program, the graduate is ready for maintenance and repair of motor transport at enterprises and organizations of the motor transport complex of various organizational and legal forms of ownership, in research, design and technological organizations, motor transport and auto repair enterprises, as well as to carry out teaching activities as a master of industrial training in professional educational institutions.

2 General characteristics of the educational program

Significance

The steady increase in the number of vehicles in our country now inevitably entails the need to address issues of its maintenance and repair. In accordance with this, there is an increasing demand for training middle-level technical personnel (which includes graduates of technical and vocational education), who should be able to work on modern technological and diagnostic equipment, to use devices and tools to perform high-quality maintenance and repair of cars. These circumstances served as the basis for many educational institutions of the technical and vocational education system to include in the list of their specialties and training of students in the specialty 6B07111 Technical service of motor vehicles (master of industrial training)

The quality of training of the future specialist and master of industrial training is the most important indicator of the work of the institutions of the technical and vocational education system and lies in the ability of the educational services provided to meet the needs and expectations of consumers. And in this an important role is played by the level of qualification of technical teaching staff.

The solution to the above problems is the training of qualified specialists in the field of vocational education with competencies in the field of training, as well as psychological, pedagogical and managerial competencies.

The educational program - 6B07111 Technical service of motor vehicles (master of industrial training) provides for the training of specialists for the transport sector of the economy of the Republic of Kazakhstan through the implementation of the principles of the Bologna Process and modern standards in this area of bachelor's degree, to provide high quality educational services in the field of professional and technical education.

Feature and competitive advantages:

A distinctive feature of the educational program is that modern requirements for the training of specialists with higher education were taken into account during the development, modern tendencies of training specialists in the system of technical and vocational education were taken into account. The program is compiled within the framework of the Bologna Process, taking into account the competence, modular and credit approaches.

The educational program is focused not only on the transfer of a system of theoretical knowledge in the field of both technical and social sciences, but, first of all, on the ability to apply this knowledge to solve real problems, i.e. on the formation of a basic level of professional competencies.

The uniqueness of the bachelor's degree program in the field of training 6B07111 Technical service of motor vehicles (master of industrial training) consists in multidisciplinary, combining technical, social and managerial sciences aimed at forming a graduate capable of carrying out not only maintenance and repair of motor transport, but also pedagogical activity as the master of industrial training.

3. Competence model (portrait) graduate

3.1 Areas of professional activity

-design-technical, technological sphere of professional activity in institutions of technical and additional professional education, in research, work out and design organizations and in production;

-pedagogical sphere of professional activity including training of specialists of working professions in the field of technical service of motor vehicles;

- service and technical, industrial sphere of professional activity, such as in car service centers for the sale, maintenance and repair of cars, at various maintenance stations of automotive equipment, in specialized enterprises providing car service services to individual consumers;

-research activities in the field of vocational education and in the workplace in the field of advanced training of employees in accordance with the specialization.

3.2 Types of professional activity

Educational - to be able to conduct theoretical and industrial training classes in accordance with the branch of training of college students, conduct theoretical and industrial training classes using modern training technologies, form professional knowledge and skills of students, monitor training at various stages of vocational training.

Upbringing- to be able to manage the educational process of colleges, develop educational and program documentation and use them to form the content of education, conduct educational work with college students;

Researching - to form the skills of research activity among college students;

Designing - to use and carry out diagnostics of electrical machines and devices, electronic equipment; To carry out calculations of elements in the structure for strength, rigidity, stability based on the laws of statistics, kinematics and dynamics; to design parts, assemblies and mechanisms, expert services in the field of motor transport affairs and motor transport activities;

Engineering - to be able to operate modern machines and equipment, motor vehicles, to design technical service enterprises: to determine the features of the technology of the industry and a separate specialty in it; to carry out professional activities in working professions; maintenance and repair of motor vehicles, checking the technical condition of motor vehicles during state technical inspection.

3.3 General education competencies

- to assess the surrounding reality on the basis of worldview positions formed by knowledge of the fundamentals of philosophy, which provide scientific understanding and study of the natural and social world by methods of scientific and philosophical cognition;
- to argue his own assessment of everything that is happening in the social and industrial spheres;
- to demonstrate a civic position based on a deep understanding and scientific analysis of the main stages, patterns and peculiarities of the historical development of Kazakhstan;
- to assess situations in various areas of interpersonal, social and professional communication, taking into account basic knowledge of sociology, political science, cultural studies and psychology;
- to use scientific methods and techniques of research of a specific science, as well as the entire socio-political cluster;
- to enter into communication in oral and written forms in Kazakh, Russian and foreign languages to solve the problems of interpersonal, intercultural and industrial (professional) communication;
- to operate with social, business, cultural, legal and ethical norms of the Kazakhstan society;
- to demonstrate personal and professional competitiveness;
- to use various types of information and communication technologies in personal activities: Internet resources, cloud and mobile services for the search, storage, processing, protection and dissemination of information.

3.4 Basic competencies

- the ability to determine the algorithm for solving a transport problem, to take into account factors when building the structure of their interrelations and identifying priority areas;
- critical understanding and analysis of options for solving problems and predicting consequences, planning and implementation of transport tasks and projects;

- the ability to prevent conflict situations when interacting with enterprises, mass media and mediate in conflict resolution;
- to analyze of the effectiveness of innovations of transport enterprises, application of management skills in innovative processes of transport equipment and technology;
- to possess of skills in handling modern technology, the ability to use information technology in the field of professional activity;
- to possess the skills of pedagogical communication and methods of managing an individual and a group, monitoring the progress of mental development of students at various levels of education, as well as to master the basics of technical systems;

3.5 Professional competencies

- the ability to develop design, technological, engineering and design estimates for the creation and repair of transport equipment;
- the ability to develop projects of transport equipment and technology taking into account technological, design, aesthetic, economic and other parameters;
- the ability to work in a team, to be flexible and mobile in various conditions, knowledge of decision-making skills in conditions of uncertainty and risk;
- to be able to conduct theoretical and industrial training classes in accordance with the branch of training college students, conduct theoretical and industrial training classes using modern training technologies, form professional knowledge and skills among students, monitor training at various stages of vocational training.

4 The base of passing professional practices

Studying practice and industrial practice

Students will undergo practical training at the following enterprises: transport enterprises and divisions; regional transport management bodies and state transport inspection; freight forwarding enterprises and organizations; enterprises and organizations operating transport equipment; branded and dealer centers of machine-building and repair plants; marketing and freight forwarding services; transport management services.

Industrial (pedagogical) practice

There is comprehensive preparation of students for independent pedagogical activity, for the application of professional and pedagogical skills and skills of organizing all types of educational work in college.

Main tasks:

- deepening and consolidation of theoretical knowledge of students;
- formation and development of future masters of industrial training in the skills and abilities of the implementation of the pedagogical process;
- preparing students to conduct various forms of training sessions and types of lessons based on knowledge of psychological, pedagogical and technical disciplines

Pre-graduate practice

To form students' professional and pedagogical skills and skills of independent conduct of educational and research work. Obtaining factual material for writing a thesis, development of conducting and statistical processing of pedagogical experiment data.

Main tasks:

- determination of the research topic based on familiarity with the problems of the educational process in the institutions of the technical and vocational education system;
- formation of students' skills to plan research work;
- mastering the basics of research methodology and methods of scientific and pedagogical research by students.

The bases of practice:

- 1) Multidisciplinary College, Astana city
- 2) Construction and Technical College, Astana city
- 3) College "Service and Tourism" Astana city
- 4) Technical College, Astana city
- 5) Polytechnic College, Astana city
- 6) Agricultural College, Akmola region, Shortandinsky district
- 7) Higher College of Shchuchinsk, Akmola region

5 Structure of the educational program

	Name of disciplines forming competencies	Total complexity	
		in academic hours	in academic hours
	CYCLE OF EDUCATIONAL DISCIPLINES	56	1680
		35	1050
1	History of Kazakhstan	5	150
2	Philosophy	5	150
3	Information and communication technology	5	150
4	Foreign language	10	300
5	Kazakh / Russian language	10	300
	Social-political module	13	390
6	Political science and sociology	4	120
7	Cultural studies and psychology	4	120
8	Basics of economics and law/ Basics of anti-corruption culture/ Introduction to leadership in education / Innovative entrepreneurship	5	150
	Physical education module	8	240
9	Physical education	8	240
	CYCLE OF BASIC DISCIPLINES	120	3600
	Basic module	23	690
10	Introduction to specialty	5	150
11	Professional psychology	4	120
12	Business language and business communication	5	150
13	Professional pedagogy	5	150
14	Practical training	3	90
15	Internship	1	30

	Pure - science disciplines module	15	450
16	Physics * / Fundamentals of science	5	150
17	Mathematics	5	150
18	Engineering mathematics */ Discrete mathematics	5	150
	Professional language disciplines module	6	180
19	English for Academic purposes */ Professional Kazakh (Russian) language	6	180
	Basic engineering module	25	750
20	Descriptive geometry and engineering graphics	5	150
21	Engineering mechanics	5	150
22	Computer graphics / Draft execution automation *	5	150
23	Fluid and gas mechanics, hydro and pneumatic actuator * / Hydraulics, hydrocars and hydraulic actuator	5	150
24	Labor protection and basics of life safety / Environmental Chemistry *	5	150
	General Technical module	15	450
25	Car theory * / Theory of tractor and vehicle	5	150
26	Internal Combustion Engines and Future Alternatives	5	150
27	Electric machines and drives * / Electrical engineering and electronics	5	150
	Design and Technology module	15	450
28	Computer-Aided Mechanism Design	5	150
29	Technology of construction materials */ Materials in engineering design	5	150
30	Design foundations and machine parts	5	150
	Profile-technical module	10	300
31	Internship	10	300
	Profile-pedagogical module	11	330
32	Pedagogical management */ Management of educational processes	5	150
33	Modern technologies in education * / Innovative educational technologies	5	150
34	Pregraduation practice	1	30
	CYCLE OF PROFILING DISCIPLINES	52	1560

	Design and Technology module	5	150
35	Fundamentals devices of vehicle and the theory of ICE (Internal combustion engine)	5	150
	Profile-technical module	15	450
36	Design and organization of technical service	5	150
37	Repair, maintenance and technical diagnostics of motor vehicles	5	150
38	Modern problems and directions of development of technologies for the use of vehicles	5	150
	Profile-pedagogical module	32	960
39	Organization of educational work	5	150
40	Methods of teaching technical disciplines	10	300
41	Organization of research work	5	150
42	Acmeology of professional development */ Formation of professional competence	5	150
43	Internship	7	210
	Total credits/hours of theoretical training	228	6840
	ADDITIONAL TYPES OF TRAINING		
	professional practice	22*	
	Practical training	3*	
	Internship	18*	
	Pregraduation practice	1*	
	final examination	12	360
	Protection of a thesis / project or passing exams in two major disciplines	12	360
	Total credits / hours	240	7200

		complete understanding of the chosen profession, helps to orient themselves in choosing the direction of professional specialization.												
11	Business language and business communication	Communication as a socio-psychological problem. Types of business communication as the basis of speech culture. Fundamentals of speech culture. The culture of business speech. Fundamentals of speech technique. Speech technique. Forms of business communication. Public speaking. Conflicts in business communication. Ethics and etiquette of business communication.	5		+									
12	Professional psychology	The purpose of the course is: to identify the interrelationships and interactions of professional psychology and individual psychological characteristics of a person due to technology, technology, organization of production, the subject of labor, the skill of the employee; to investigate psychological and pedagogical issues of vocational training and vocational education. As a result of the study, students will know: the professional formation of the worker's personality; psychological aspects of vocational training and education; psychological features of the organization of the work of students; students will apply the methods of professional psychology to study of the student's personality; identify professionally important personality qualities for a particular profession or specialty.	5		+									
13	Professional pedagogy	The purpose of the discipline: the formation of professional competence through the assimilation of theoretical foundations and practice-oriented aspects of pedagogical science. As a result of mastering the course, students will be able to: explain the	5		+						+			

		theoretical and methodological foundations of professional pedagogy; systematize the basic concepts of professional pedagogy; apply forms, methods and means of interaction with participants in the educational process; design the educational process; plan professional activities taking into account the laws and principles of training, development, education; evaluate the social role of the teaching profession in modern society.												
14	Mathematics	Formation of theoretical and practical foundations and training to determine the types and solution of differential equations. Basic concepts, terms and definitions of vector algebra and analytical geometry, probability theory and mathematical statistics. Methods of solving systems of linear equations, problems related to matrices and the study and solution of engineering problems.	5			+								
15	Descriptive geometry and engineering graphics	Development of spatial imagination and instilling the skills of correct logical thinking, methods of constructing images of spatial forms on a plane, measuring these forms, allowing the transformation of images, rules for design documentation in accordance with the Unified System of Design Documentation (ESCD), execution and reading of drawings of individual parts and assembly units.	5					+						
16	Engineering mechanics (Statics, Dynamics)	The development of the academic discipline considers the general laws of the mechanical movement of bodies and their equilibrium. The main provisions related to the laws of equilibrium and motion of points of a mechanical system, taking into account the geometric forms of motion and under the influence of factors causing certain types of motion. Methods of transformation of systems of forces and	5					+	+					

		conditions of equilibrium of material bodies, general laws of dynamics of motion of mechanical systems necessary for solving engineering problems												
17	Computer-Aided Mechanism Design	The course "Computer-Aided Mechanism Design" sets out the scientific foundations for the construction of mechanisms, machines and devices, as well as methods for their theoretical and experimental research. The process of course design of flat-lever mechanisms of machines. Creation and development of models of mechanisms in the CAD editor. Methods of kinematic and dynamic studies of mechanisms in the CAD system. Automation of design in the analysis and synthesis of mechanisms	5					+			+			
18	Design foundations and machine parts	The device, principle of operation, technical characteristics, the scope of the basic mechanisms, standard parts and components of machines; bases of calculations of parts and units of machines on the criteria of performance; skills of analysis of the device and the principle of operation of mechanisms and units of machines.	5					+						
19	Internal Combustion Engines and Future Alternatives	Formation of a system of competencies for solving professional tasks on the effective use of car engines and mastering the methodology and skills of independently solving problems in the design, calculation and evaluation of technical and economic indicators of internal combustion engines, the study of alternative engines, traction dynamics and fuel efficiency, dynamic characteristics of the car.	5							+				
Cycle of basic disciplines Optional component														
20	Physics	To form a system of fundamental knowledge in physics among students, contributing to the effective solution of practical problems of agricultural production, as well as further personal development;	5				+							

		the basics of scientific worldview and modern physical thinking; to get acquainted with scientific equipment and methods of physical research, to acquire the skills of conducting a physical experiment; to apply the knowledge gained for the correct interpretation of basic physical phenomena.													
21	Fundamentals of science	Fundamentals of natural sciences the basis of all modern technics and technology. The study of physics creates the foundations of theoretical training and the fundamental component of educational programs. The fundamental and basic laws of physics allow us to understand the natural phenomena taking place, to be aware of the ways and methods of their description, scientific research and rational processing of observational data	5			+									
22	English for Academic purposes	The course is designed for development of the academic skills necessary for conducting academic professional activities and research work: the ability to write an academic text, the ability to listen and take notes of a lecture in English, the ability to write articles in English, with subsequent publication, public speaking skills in an academic presentation format.	4				+								
	Professionally-oriented Foreign Language	To form the professional foreign language speech of future specialists to increase the level of professional competence, proficiency in a professional foreign language for the implementation of written and oral information exchange, further development of speech activity (reading, writing, listening and speaking - monologue and dialogic speech). Rules of speech behavior in accordance with situations of professional communication, depending on the style and nature of communication in the social,					+								

		household and academic spheres.													
23	Engineering mathematics	General information of mathematical description and modeling of various real phenomena and processes. combined disciplines combining elements of physics, mathematics, computer methods of calculation are focused on the application of established methods for the design and analysis of engineering solutions in the field of mechanical engineering.	5			+									
	Discrete mathematics	Course Description: "Discrete Mathematics" is an integral part of the mathematical education of future engineers. Discrete Mathematics Apparatus is the main research tool for professionals involved in the creation and operation of computers, programming languages, information transmission and processing tools, automated control systems and design.	5			+									
24	Draft execution automation	Study of the basic principles and methodologies of modern computer-aided design when creating electronic tools, methods and techniques for solving problems in the main sections of the discipline using design automation tools, creation of mathematical models of construction, automation of preparation and release of design and technological documentation: SolidWorks systems, Compass 3D, Altium Designer, T-Flex CAD.	5					+							
	Computer graphics	Formation of knowledge of design documentation in accordance with standards, rules for constructing drawings of detachable and one-piece connections of parts and assembly units, developing the skills necessary to complete and read technical drawings, perform sketches of parts, draw up design and technical documentation for production. Proficiency in working with computer drawing programs at a high	5					+							

		level.												
25	Occupational safety and the basics of health and safety	Formation of students knowledge, practical skills and abilities to create safe and healthy working conditions, to prevent the causes and conditions the emergence of a dangerous situations, to protect the population and production staff of national economy objects from the consequences of possible emergencies. The specific features of labor protection for women and youth, supervision and control of the implementation of health and safety legislation and liability for violations of the requirements of occupational safety.	5					+						
	Environmental Chemistry	Environmental protection or nature protection, nature protection is a set of measures designed to limit the negative impact of human activity on the environment. The diversity of the impact of scientific and technological progress on the surrounding biosphere. Protection and improvement of the environment for the prosperity of our and future generations	5					+						
26	Fluid and gas mechanics, hydro and pneumatic actuator	Methods of calculating the parameters of hydraulic machines, control and control elements; characteristics of hydraulic and pneumatic drives; calculate the characteristics of hydraulic machines, hydraulic drive; calculate the characteristics of the control and regulation of the hydraulic drive, read and make schemes of hydraulic and pneumatic drives; the main methods of calculation of hydraulic machines and controls and regulation of hydraulic drives	5						+	+				
	Pneumatic and hydraulic drives	Studying of technological equipment using hydraulic and pneumatic drives, classification of hydropneumatic machines and drives, features of	5						+	+				

		hydraulic and pneumatic systems. The principle of operation and structural elements of hydraulic pneumatic actuators. Purpose, classification and characteristics of volumetric drives and calculation of mechanical energy losses in drives.												
27	Technology of construction materials	The ability to possess knowledge of the structure of the composition and properties of various materials (metals and nonmetals) to understand the technologies and methods of obtaining materials processing, using modern machines, machines and equipment to solve design, operational, experimental, research and design problems.	5						+					
28	Materials in engineering design	The studying of the basics of design and engineering activities in mechanical engineering, which allows students to solve a wide range of practical problems related to the design of machine structures using the most modern scientific achievements, technologies and technical solutions in the field of engineering technical developments.	5							+				
29	Car theory	Methods of determining the main traction, kinematic and fuel-economic parameters of cars, factors affecting the modes and durability, methods of traction testing of cars; methods and applications of calculation of units, assemblies and systems of transport and technological means	5							+				
	Tractors and cars	Formation of bachelor's skills in acquisition and operation of the company's tractor and vehicle fleet. Studying the basics of theory and calculation, engines, testing of tractors and vehicle necessary for the effective operation of machines in agro-industrial production and their operational modes of operation, technological properties.	5							+				
30	Electric machines	Types of electromechanical energy converters;	5						+					

		improve the engine. The study of the theory and calculation of the engines of vehicles. Determination of operational and economic indicators of the internal combustion engine of transport equipment. The current state and development prospects of various internal combustion engines												
34	Design and organization of technical service	The studying of the rules for the design of technical service facilities of the agro-industrial complex, the justification of the production program of the service enterprise, the design of production zones and auxiliary units, the basics of the design of the construction part, the design features of service stations, refueling complexes, machine-technological stations and repair shops, technical and economic evaluation of design solutions. fundamentals of the design of reconstruction, re-specialization, expansion and technical re-equipment of technical service facilities.	5					+			+			
35	Modern problems and directions of development of technologies for the use of vehicles	Changes in the classification, indexing and general structure of vehicles. Development of internal combustion engines. Lubrication and cooling system. Electrics. Vehicle ignition system. The system of electric start of vehicles. Clutch. Transmission. Chassis of vehicles. Steering.	5								+			
36	Technical diagnostics and repair of vehicles	General characteristics of technological processes to ensure the efficiency of transport equipment in the production and repair. Interrelation of design, production, operation and repair of transport equipment. Development and registration of technological influences on units, systems of transport equipment at production and carrying out repairs. Characteristics and organizational and	5								+			

