NJSC "Kazakh National Research Technical University named after K.I. Satbayev»
Institute of Metallurgy and Industrial Engineering
Department of «Technological machines, transport and logistics»

EDUCATIONAL PROGRAM

«TECHNOLOGY AND AUTOMATION OF TRANSPORT AND TRANSPORT SYSTEMS»

(scientific and pedagogical direction (2 years))

Master of sciences in services in the educational program « 7M11301 - Technology and automation of transport and transport systems»

Almaty 2020

The program is compiled and signed by the parties:

From KazNTU them K.Satbayev:

1. Head of the Department K.K.Elemesov
2. Director of the Institute K.K.Elemesov
3. The Chairman of the Department of UMC R. A. Kuzbagarov

From employers:

1. Representative of the Specialty Council «Transport Engineering", Director LLP «Жәкен Қалша» M.K. Azimbekov

From a partner university:

Approved at the meeting of the Educational and Methodological Council of the Kazakh National Research Technical University named after K. I. Satbayev. Protocol № 4 от «14» 01 2020

Qualification:

Level 7 of the National Qualifications Framework: a well-erudite specialist with fundamental scientific training, who knows the methodology of scientific and pedagogical creativity, modern information technologies, and is prepared for scientific and pedagogical work.

Professional competence: organization of transportation, movement and operation of transport

Short description of the program:

1. The purpose of the educational program

The goal of the training program of scientific and pedagogical direction (programs of scientific and pedagogical magistracy) is the graduate students in educational, methodologies and research competence, as well as the necessary knowledge and skills in the application of modern technical management tools in the systems of automation of transport appointments are necessary for training specialists for scientific and pedagogical activity in system of the higher and postgraduate education and research sector.

2. Types of employment

Labor activity in research on research, scientific-pedagogical, design and design-technological organizations, as well as the departments of industrial enterprises, covering the lifecycle of systems of automation of technological process and production, the transport sector of the national economy and scientific-pedagogical activity in the field of automation and control of transport equipment, carried out in educational the institution.

3 Objects of professional activity

Objects of professional activity of a graduate are institutions of higher and medium-sized businesses a professional education, scientific research and design institutes, firms and organizations (enterprises), occupying existing technology transportation, as well as designing, manufacturing, operation of ground-vehicle mobile machine, the mobile technology car and technological transport a range of agricultural, page, transport, military-transport and transport-technological purposes, engineering and normative-technical documentation, automation of transport and transport systems, methods and means of testing and control of quality transport products.

EDUCATIONAL PROGRAM PASSPORT

1 Volume and content of the program

The duration of the master's degree program is determined by the amount of academic credits completed. Upon completion of the set amount of academic credits and achievement of the expected learning outcomes for obtaining a master's degree, the Master' s degree program is considered fully developed. In the scientific and pedagogical master's program, there are at least 120 academic credits for the entire period of study, including all types of educational and scientific activities of the master's student.

Planning of the content of education, the method of organizing and conducting the educational process is carried out by the university and scientific organization independently on the basis of credit technology of training.

The Master's degree in scientific and pedagogical directiony implements educational programs of postgraduate education for the training of scientific and scientific-pedagogical personnel for universities and scientific organizations with in-depth scientific and pedagogical and research training.

The content of the Master' s degree program consists of:

1) theoretical training, including the study of cycles of basic and core disciplines;

2) practical training of undergraduates: various types of internships, scientific or professional internships;

3) research work, including, the implementation of a master's dissertation for a scientific and pedagogical master's degree;

4) final certification.

The content of the OP

Thus, the completion of an educational programs provides for theoretical training (studying the cycle of basic disciplines, the cycle of profile disciplines), passing pedagogical and research practices, performing research work, as well as writing and defending a master's thesis. Within the framework of educational programs, the profile disciplines allow for targeted training of personnel in the specialty for professional activities in the field of land transport, transport engineering and technology, transportation organization, transport movement and operation, logistics and their automation.

Objectives of the educational program:

- providing quality assurance of education in the specialty «Technology and automation of transport and transport systems» due to the introduction of mandatory requirements for the level of training of undergraduates and educational activities of the universities;
- regularization of the rights of subjects of educational activity;

- improving the objectivity and informativeness of the assessment of undergraduates ' training and the quality of educational programs;
- creating conditions for academic mobility of undergraduates;
- ensuring the functioning of the unified educational space of Kazakhstan;
- ensuring the recognition of documents of the Republic of Kazakhstan on awarding the academic degree "Master" in the international educational space and in the international labor market.

2 Entry Requirements

The previous level of education of applicants is higher professional education (bachelor's degree). The student must have a diploma of the established standard and confirm the level of English language proficiency with a certificate or diplomas of the established standard.

The procedure for admission of citizens to the master's program is established in accordance with the "Standard Rules for Admission to study in Educational organizations that implement educational programs of postgraduate education".

The formation of a contingent of undergraduates is carried out by pplacing a state educational order for the training of scientific and pedagogical personnel, as well as paying for training at the expense of citizens ' own funds and other sources. The State provides citizens of the Republic of Kazakhstan with the right to receive free postgraduate education on a competitive basis in accordance with the state educational order, if they receive this level of education for the first time.

At the" entrance", a master's student must have all the prerequisites necessary for mastering the relevant master's degree program. The list of required prerequisites is determined by the higher education institution independently.

In the absence of the necessary prerequisites, the master's student is allowed to master them on a paid basis.

3. Requirements to complete the course and receive a diploma

Degree/ qualifications awarded: A graduate of this educational program is awarded an academic degree "Master" (Master of sciences in services) in the field of "Transport technology and automation of transport and transport systems".

A graduate who has completed Master' s degree programs must have the following general professional competencies:

– ability to independently acquire, comprehend, structure and use new knowledge and skills in professional activities, develop their innovative abilities;

– ability to independently formulate research goals, establish the sequence of solving professional problems;

– ability to apply in practice knowledge of fundamental and applied sections of disciplines that determine the focus (profile) of the master's program;

– the ability to professionally select and creatively use modern scientific and technical equipment to solve scientific and practical problems;

– ability to critically analyze, present, defend, discuss and disseminate the results of their professional activities;

– proficiency in the preparation and execution of scientific and technical documentation, scientific reports, reviews, reports and articles;

– willingness to lead a team in the field of their professional activities, tolerating social, ethnic, confessional and cultural differences;

– readiness for communication in oral and written forms in a foreign language to solve problems of professional activity.

A graduate who has completed a master's degree program must have professional competencies that correspond to the types of professional activities that the master's program is focused on:

research activities:

– the ability to form diagnostic solutions to professional problems by integrating the fundamental branches of science and specialized knowledge obtained during the development of the master's program;

– ability to independently conduct scientific experiments and research in the professional field, summarize and analyze experimental information, draw conclusions, formulate conclusions and recommendations;

– the ability to create and research models of the studied objects based on the use of in-depth theoretical and practical knowledge in the field of technology and automation of transport and transport systems;

– *research and production activities:*

– ability to independently conduct production and research-and-production field, laboratory and interpretation work in solving practical problems;

– ability to professionally operate modern field and laboratory equipment and instruments in the field of a master's degree program;

– ability to use modern methods of processing and interpreting complex information to solve production problems;

– *project activities:*

– ability to independently draw up and submit research and production projects;

– willingness to design interdisciplinary scientific research and scientific-production work in solving professional problems;

– *organizational and managerial activities:*

– readiness to use practical skills in organizing and managing research and production activities in solving professional problems;

– readiness for practical use of regulatory documents in planning and organizing research and production activities;

– *scientific and pedagogical activity:*

– ability to conduct seminars, laboratory and practical exercises;

– ability to participate in the management of scientific and educationalwork of students in the field of technology and automation of transport and transport systems.

When developing a master's degree program, all general cultural and general professional competencies, as well as professional competencies related to the types of professional activities that the master's program is focused on, are included in the set of required results of mastering the master's program.

МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РЕСПУБЛИКИ КАЗАХСТАН
КАЗАХСКИЙ НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ ТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ

APPROVED
Rector KazNRTU named after K. I. Satpayev
_____ I. K. Beisembetov
«___» _____ 2020

MODULAR CURRICULUM

Education program: **7M11301- Technology and automation of transport and transport systems**

Form of study: full Duration of training: 2 years *Academic degree: Master of sciences in services*

The cycle	code	Name of disciplines	Semester	Acad. credits	lec.	lab.	prac	IWS	Type of contro	Chair
Profile training module										
Basic disciplines (BD) (40 credits)										
University component (18 credits)										
BD	HUM201	History and philosophy of science	1	4	1	0	1	2	Exam	SD
BD	HUM207	Higher school pedagogy	1	4	1	0	1	2	Exam	SD
BD	LNG202	Foreign language (professional)	2	6	0	0	3	3	Exam	EL
BD	HUM204	Management psychology	2	4	1	0	1	2	Exam	SECPM
Practice-oriented module										
	AAP244	Pedagogical practice	2	4					Report	
Choice component (18 credits)										
BD	TRA222	Sustainable logistics and transport	1	6	2	0	1	3	Exam	TMTaL
BD	TRA203	Current problems of transport science, technics and technology								
BD	TRA205	Information support systems for design, manufacture and maintenance of ground transport and technological machines	2	6	2	1	0	3	Exam	TMTaL
	TEC523	Intellectual Property Protection								
BD	TRA206	Automated systems for solving logistics problems	2	6	2	1	0	3	Exam	TMTaL
	TRA226									
Major disciplines (MD) (42 credits)										
Choice component (CC)										
Module of automation and modeling in transport and transport and logistics systems										
MD	TRA221	Supply Chain Design for Production Systems	2	6	2	1	0	3	Exam	TMTaL
	TRA455	Simulation modeling of logistics processes and systems								
MD	TRA207	Automation Systems in Road Transport	2	6	2	0	1	3	Exam	TMTaL
	TEC533	Innovative methods for repairing machine parts								
MD	TRA230	Innovative Technology in the Supply Chain	3	6	2	1	0	3	Exam	TMTaL

MD	TRA212 TRA227	Supply Chain Modeling Logistic tasks modeling	3	4	1	0	1	2	Exam	TMTaL
MD	TRA224	Strategic Supply Chain Management	3	6	2	0	1	3	Exam	TMTaL
MD	TRA209	Electric cars	3	4	2	0	1	3	Exam	TMTaL
MD	TRA214	Modern transportation technologies in supply chains	3	4	2	0	1	3	Exam	TMTaL
Transport technology module										
MD	TRA210	Technological equipment and production and technical infrastructure of enterprises	3	6	2	0	1	3	Exam	TMTaL
MD	TRA204	Research and testing of transport and transport-technological machines	3	6	2	0	1	3	Exam	TMTaL
MD	TRA213	Fundamentals of the performance of technical systems	3	4	1	0	1	2	Exam	TMTaL
Practice-oriented module										
MD	AAP236	Research practice	4	7					Report	TMTaL
Research Module (24 credits)										
MSSR	AAP242	Master's student scientific research	1	6					Report	TMTaL
MSSR	AAP242	Master's student scientific research	2	6					Report	TMTaL
MSSR	AAP242	Master's student scientific research	3	6					Report	TMTaL
MSSR	AAP242	Master's student scientific research	4	6					Report	TMTaL
Module of final attestation (12 credits)										
FA	ECA205	Registration and defense of the master's thesis	4	12					Defense of dissertation	TMTaL
		Total		**125**						

Vice-Rector for Research and Academic Affairs — D.K. Nauryzbayeva

Chair of the APC — K.B. Tulegenova

Director of the Institute of Metallurgy and Industrial Engineering — K.K. Elemessov

Head of the Department Department of Technological machines, transport and logistics — K.K. Elemessov

5 Descriptors of the level and volume of knowledge, skills, abilities and competencies

Requirements for the master's degree level are determined on the basis of the Dublin Descriptors of the second level of higher education (Master's degree) and reflect the mastered competencies expressed in the achieved learning outcomes.

Learning outcomes are formulated both at the level of the entire master's degree program, and at the level of individual modules or academic discipline.

Descriptors reflect learning outcomes that characterize the student's abilities:

1) demonstrate developing knowledge and understanding of transport technologies in the field under study based on advanced knowledge in the field of transport automation transport systems, and develop and / or apply ideas in the context of research;

2) apply your knowledge, understanding and abilities at a professional level to solve problems in a new environment, in a broader interdisciplinary context;

3) collect and interpret information to form judgments based on social, ethical and scientific considerations;

4) clearly and unambiguously communicate information, ideas, conclusions, problems and solutions, both to specialists and non- specialists;

5) training skills necessary for independent continuation of further training in the field of "Transport technology and automation of transport and transport systems".

6 Competences to complete the training

6.1Requirements for the key competencies of graduates *of the scientific-and pedagogical master*'s program, must::

1) have a view:

– on the role of science and education in public life;
– on current trends in the development of scientific knowledge;
– on current methodological and philosophical problems of natural (social, humanitarian, economic) sciences;
– about the professional competence of a higher school teacher;
– on contradictions and socio-economic consequences of globalization processes;

2) know:

– methodology of scientific knowledge;
– principles and structure of scientific activity organization;
– psychology of students ' cognitive activity in the learning process;
– psychological methods and means of improving the effectiveness and quality of training;

3) be able to:

– use the acquired knowledge for original development and application of ideas in the context of scientific research;

– critically to analyze existing concepts, theories and approaches to the analysis of processes and phenomena;

– integrate knowledge gained from different disciplines to solve research problems in new and unfamiliar environments;

– through the integration of knowledge to make judgments and to make decisions based on incomplete or limited information;

– apply the knowledge of pedagogy and psychology of higher education in their teaching activities;

– apply interactive learning methods;

– carry out information-analytical and information-bibliographic work with the involvement of modern information technologies;

– think creatively and take a creative approach to solving new problems and situations;

– be fluent in a foreign language at a professional level that allows you to conduct scientific research and teach special subjects in higher education institutions;

– summarize the results of research and analytical work in the form of a dissertation, scientific article, report, analytical note, etc.;

4) have the skills:

– research activities, decision of standard scientific tasks;

– implementation of educational and pedagogical activities based on credit technology of training;

– methods of teaching professional subjects;

– use of modern information technologies in the educational process;

– professional communication and cross-cultural communication;

– public speaking skills, correct and logical presentation of their thoughts in oral and written form;

– expand and deepen the knowledge necessary for daily professional activities and continuing education in the doctoral program.

5) to be competent:

– in the field of scientific research methodology;

– in the field of scientific and scientific-pedagogical activity in higher educational institutions;

– in matters of modern educational technologies;

– in the implementation of scientific projects and research in the professional field;

– in ways to ensure constant updating of knowledge, expansion of professional skills and abilities.

B – Basic knowledge, skills and abilities

B1 – Possession of basic knowledge in the field of natural science and pedagogical disciplines that contribute to the formation of a highly educated person with a broad outlook and a culture of thinking;

B2 – Possession of skills in handling modern equipment, ability to use information technologies in the field of professional activity;

B3 – Proficiency in acquiring new knowledge necessary for daily professional activities and continuing education in the doctoral program;

B4 – Proficiency in one of the far-abroad languages at a level higher than conversational;

P – Professional competencies:

P1 –Wide range of theoretical and practical knowledge in the professional field;

P2- Dreadiness to participate as part of a team of performers in the development of transport and transport-technological processes, their elements and technological documentation;

P3 – He is able to teach the technology and forms of organization of diagnostics, features of maintenance and repair of transport and transport-technological machines, technical and technological equipment and transport communications, as well as the causes and consequences of the termination of their performance in the process of preparing students in the system of secondary special,вjunior, postgraduate education;

P4- He is able to teach automated design of technological processes of maintenance and repair (parts, components and assemblies) of motor vehicles, control and design programs in the process of preparing students in the system of secondary special, higher, postgraduate education;

P5 – He is able to teach automated design of technological processes of cargo transportation in the process of preparing students in the system of secondary-special, higher, postgraduate education;

P6 – He is able to teach the adjustment and operation of ground transport equipment in the process of training students in the system of secondary-special, higher, postgraduate education;

P7 - He is able to teach the design of vehicle links in the process of preparing students in the system of secondary-special, higher, postgraduate education;

P8– He is able to teach technical conditions and rules a rational operation of transport and transport-technological machines and equipment in the process of training students in the system of secondary special, higher, postgraduate education;

P9- Is able to train safe conditions and efficient operation of transport and transport-technological machines, their components and aggregates and technological equipment;

P10- ability to provide students of secondary, and higher educational institutions with knowledge on planning and organizing the operation of transport complexes in cities and regions, organizing the rational interaction of modes of transport that make up a single transport system, when transporting passengers, luggage, cargo and cargo;

P11 - ability to provide students of secondary, and higher educational institutions with knowledge on the organization of rational interaction of various modes of transport

in a single transport system and effective commercial work at the transport facility, development and implementation of rational methods of working with the client;

P12 - With the ability to provide students of secondary, and higher educational institutions with осуществлению knowledge about the implementation of technical documentation reviews, supervision and control of the condition and operation of ground transport, transport infrastructure facilities, identify reserves, identify the causes of malfunctions and shortcomings in operation, take measures to eliminate them and increase the efficiency of use;

P13 – With the ability to provide students with vocational, educational institutions finding ways to improve the quality of transport-logistic service cargo, development of commodity market infrastructure and distribution channels, and to determine the optimization parameters of the logistic transport chains and links taking into account the criteria of optimality;

P14 - With the ability to provide students of secondary-special, higher educational institutions with knowledge on developing the most effective schemes for organizing the movement of vehicles and apply the latest technologies for managing the movement of vehicles;

P15 - ability to provide students of secondary, and higher educational institutions with knowledge on identifying priorities for solving transport problems, taking into account indicators of economic efficiency and environmental safety, and use modern information technologies as a tool for optimizing management processes in the transport sector;

P16 - Ability to provide students of secondary, and higher educational institutions with knowledge on designing logistics systems for cargo and passenger delivery, choosing a logistics intermediary, carrier and freight forwarder based on a multi-criteria approach;

P17 - With the ability to provide students of secondary, and higher educational institutions with knowledge about project development and implementation: modern logistics systems and technologies for transport organizations, intermodal and multimodal transportation technologies, optimal routing;

O - Universal, social and ethical competencies

O1-Knowledge of the traditions and culture of the peoples of Kazakhstan and compliance with the norms of business ethics, knowledge of ethical and legal standards of conduct

O2-Be tolerant of the traditions and culture of other peoples of the world;

O3 - Understanding the basics of the legal system and legislation of Kazakhstan;

O4- Understanding of social development trends in society, ability to navigate adequately in various social situations;

O5- Awareness of social significance of your future profession, having a high motivation to perform professional activities;

O6-Introduction of basic methods for protecting production personnel and the public from the possible consequences of accidents, catastrophes, and natural disasters;

C-Special and managerial competencies:

C1 – Proper management and control of the processes of work and educational activities within the framework of the organization's strategy, policy and goals, discussion of the problem, reasoning of conclusions and competent information management;

C2-Mastering the basics of economic knowledge, scientific ideas about management, marketing, finance, etc.;

C3 –Understanding and understanding the goals and methods of state regulation of the economy, the role of the public sector in the economy;

C4-Ability to search, analyze and evaluate information for preparing and making managerial decisions, readiness to take responsibility for them, as well as give instructions, manage the actions of other people, taking into account the abilities, capabilities and motivation of employees;

C5 –Ability to navigate modern information flows and adapt to dynamically changing phenomena and processes in the global economy;

C6-Bis flexible and mobile in various conditions and situations related to professional activities;

C7-Knowledge of the purpose, classification, design and operation principles of transport vehicles and equipment;

C8- Knows how to check the technical condition and remaining life of equipment, organize preventive inspection and routine repairs;

C9- is capable of performing strength calculations and calculations for determining the drive power of machines, justifying their choice for given conditions and production volumes;

C10 –Able to take part in the calculation and design of parts and assemblies of machine-building structures in accordance with technical specifications and using standard design automation tools.

6.2Requirements for the research work of a master's student in the scientific and pedagogical master's program:

1) corresponds to the profile of the master's degree program in which the master's thesis is being performed and defended;

2) it is relevant and contains scientific novelty and practical significance;

3) is based on modern theoretical, methodological and technological achievements of science and practice;

4) is performed using modern methods of scientific research;

5) contains research (methodological, practical) sections on the main protected provisions;

6) is based on international best practices in the relevant field of knowledge.

6.3 Requirements for the organization of practices:

The educational program of the scientific and pedagogical master's degree includes two types of practical training, which are conducted in parallel with theoretical training or in a separate period:

1) teaching in the DB cycle – at the university;

2) research in the PD cycle-at the place where the dissertation is performed.

Pedagogical practice is conducted with the aim of developing practical skills in teaching and learning methods. At the same time, undergraduates are involved in conducting undergraduate classes at the discretion of the university.

The master's research practice is conducted in order to get acquainted with the latest theoretical, methodological and technological achievements of domestic and foreign science, modern methods of scientific research, processing and interpretation of experimental data.

7 Appendix to the ECTS Diploma

The app is developed according to the standards of the European Commission, the Council of Europe and UNESCO/Sepes. This document serves only for academic recognition and is not an official confirmation of the document of education. It is not valid without a higher education diploma. The purpose of completing the European Application is to provide sufficient data on the diploma holder, the qualification obtained, the level of this qualification, the content of the training program, the results, the functional purpose of the qualification, as well as information about the national education system. The application model that will be used for transferring grades uses the European Credit Transfer or Transfer System (ECTS).

The European Diploma Supplement provides an opportunity to continue your education at foreign universities, as well as confirm your national higher education for foreign employers. When traveling abroad for professional recognition, additional legalization of the diploma of education will be required. The European Diploma Supplement is completed in English upon individual request and is issued free of charge.

Foreign language (Professional)

CODE – LNG202
CREDIT – 6 (0/0/3)

COURSE GOALS AND OBJECTIVES

Thanks to these courses, you will master specific terminology, be able to read specialized literature, and gain the knowledge necessary for effective oral and written communication in a foreign language in your professional activities.

BRIEF DESCRIPTION OF THE COURSE

In the course of training, students gain knowledge of a foreign language, including proficiency in specialized vocabulary, necessary for effective oral and written communication in a foreign language in their professional activities. Practical tasks and methods for developing the required language skills in the learning process include: case studies and role-playing games, dialogues, discussions, presentations, listening tasks, working in pairs or in groups, performing various written tasks, grammar tasks and explanations.

KNOWLEDGE, SKILLS AND ABILITIES AT THE END OF THE COURSE

As a result of mastering the discipline, the student will develop a professional lexical vocabulary, possess the skills of effective communication in a professional environment, the ability to correctly express thoughts in oral and written speech, understand specific terminology and read specialized literature.

History and philosophy of science
CODE-HUM201
CREDIT – 4 (1/0/1)

THE GOALS AND OBJECTIVES OF THE COURSE are to reveal the connection between philosophy and science, highlight the philosophical problems of science and scientific knowledge, the main stages of the history of science, leading concepts of the philosophy of science, modern problems of the development of scientific and technical reality

BRIEF COURSE DESCRIPTION the subject of philosophy of science, science dynamics, the specifics of science, science and pradnya, the antiquity and the emergence of theoretical science, main stages of the historical development of science, characteristics of science, post-non-classical science, philosophy, mathematics, physics, engineering and technology, the specifics of engineering Sciences, ethics of science, social and moral responsibility of the scientist and engineer

KNOWLEDGE and SKILLS UPON completion of the COURSE - know and understand the philosophical questions of science, the main historical stages of development of science, leading to the concept of philosophy of science, to be able to critically evaluate and analyze scientific and philosophical problems, to understand the specifics of engineering science, possess the skills of analytical thinking and philosophical reflection, to be able to justify and defend its position, own techniques of discussion and dialogue, to master the skills of commutatively and creativity in their professional work

Pedagogy of higher education
CODE-HUM207
CREDIT – 4 (1/0/1)

PURPOSE AND OBJECTIVES OF THE COURSE the course is aimed at studying the psychological and pedagogical essence of the educational process of higher education; forming ideas about the main trends in the development of higher education at the present stage, considering the methodological foundations of the learning process in higher education, as well as psychological mechanisms that affect the success of learning, interaction, management of subjects of the educational process. Development of psychological and pedagogical thinking of undergraduates.

BRIEF DESCRIPTION OF THE COURSE during the course, undergraduates get acquainted with the didactics of higher education, forms and methods of organizing training in higher education, psychological factors of successful learning, features of psychological influence, mechanisms of educational influence, pedagogical technologies, characteristics of pedagogical communication, mechanisms for managing the learning process. They analyze organizational conflicts and ways to resolve them, psychological destructions and deformations of the teacher's personality.

KNOWLEDGE, SKILLS UPON completion of the COURSE – upon completion of the course the student should **know** the peculiarities of the modern system of higher professional education, organization of educational research, characteristics of subjects of educational process, didactic principles of organization of the learning process in higher education, educational technology, patterns of pedagogical communication, especially educational influences on students and problems of pedagogical activity.

Management psychology
CODE HUM204
CREDIT 4 (1/0/1)

COURSE GOALS AND OBJECTIVES

The goal is to master the methods of psychological analysis of management activities based on theoretical knowledge.

The aim of the course is to study the regularities of the organization of the management process and the relations between people that arise during this process, to develop a system and methods of active influence on the object of management, and to determine ways to anticipate and predict the studied processes.

BRIEF DESCRIPTION OF THE COURSE

Course content: Organization of personnel. Introduction to the subject of management psychology. History, philosophy and concepts of HR management. Personality as an object of management. Methods of personnel management. Mental properties of the individual. Impact on the individual. Methods and techniques of effective influence. Planning of work with personnel in the organization. Personality psychology and personnel policy. Technology of personnel management. Psychological aspects of personnel selection and adaptation. Methods, techniques, and personnel diagnostics. The adaptation period. Motivation of professional activity of personnel. Theory of activity. Leading activities at different ages. External and internal motives. Training and certification of personnel, psychological approach. Psychological aspects of the release and dismissal of staff. Organizational culture as a socio-psychological problem. Formation of the corporate culture of the organization. Head of the HR management system. Creating an image as an integral part of the communication culture. Mental properties of the individual, self-esteem and the concept of personality. Psychology of managerial (business) communication. Strategies for behavior in conflicts. Psychology of career management in an organization.

KNOWLEDGE, SKILLS AND ABILITIES AT THE END OF THE COURSE

As a result of studying this course, the master's student must::

Know:

- the subject and main functions of HR management psychology and the areas of application of its tools in various areas of life;

Be able to:

- acquire systematic knowledge in the field of management psychology;

Own:

- personnel management skills, knowledge of the discipline as a science of interpersonal interactions in various spheres of life.

Sustainable logistics and transport
CODE – TRA222
CREDIT – 6 (2/0/1)

BRIEF DESCRIPTION OF THE COURSE

Discipline content: Applied aspects of sustainable logistics, supply chain and transport. Analysis of the impact of environmental decisions on logistics systems and transport. Sustainable logistics, closed supply chains, reverse logistics. Sustainable Supply Chain Strategy.

Current problems of transport science, technics and technology
CODE – TRA203
CREDIT – 6 (2/0/1)

COURSE GOALS AND OBJECTIVES

The purpose of teaching the discipline "Modern problems of transport science, engineering and technology" is to teach students the basics of the conceptual apparatus of transport science, engineering and technology, from the point of view of modern processes of functioning and interaction of various organizational and production structures.

Tasks of mastering the discipline:

- to study new research methods in the field of transport science, engineering and technology;
- provide new knowledge and skills for practical work in the field of transport science and technology;
- train up-to-date equipment and devices used in monitoring traffic flows for professional operation;
- teach to use in practice the laws of cognitive activity, basic philosophical concepts about the stages and forms of development of scientific knowledge, the main stages of technological progress.

BRIEF DESCRIPTION OF THE COURSE

Content of the discipline. Regularities, forms andtechnologiesof cognitive activity. Basic concepts of the stages and forms ofscientific knowledge development. Concepts ofscientific knowledge development. Methods and formsof scientific cognition. Main stages of technological progress. Stages of technological progress; developmentof transport science. Features of the current stage of scientificтand technical progress. The impact of scientific and technological progress onthe state of the world economy. The role of engineering and technology in the development of modern society and the ability to use them in practice.

KNOWLEDGE, SKILLS AND ABILITIES AT THE END OF THE COURSE

As a result of mastering the discipline program, the master's student must::

know-the main directions and trends in the development of transport equipment, transport technologies and production facilities;

be able to use information support for the main positions of transport science, engineering and technology, taking into account social aspects;

master - methods and forms of scientific knowledge;

Information support systems for design, manufacture and maintenance of ground transport and technological machines

CODE – TRA205

CREDIT – 6 (2/1/0)

COURSE GOALS AND OBJECTIVES

The purpose of mastering the discipline: formation of theoretical and practical knowledge of information systems for ensuring technological processes in the field of design, manufacture and maintenanceof ground transport and technological vehicles.

The task of the discipline is to form knowledge about the design and calculation of ground-based transport and technological vehicles .

BRIEF DESCRIPTION OF THE COURSE

Summary of the discipline: Existing information systems for the design, production and operation of machinery and equipment, information model of the life cycle of mechanical engineering products, CALS information technologies, ISO standards in the field of information technologies for supporting production processes, introduction of CALS information support products in the production process of machine design and manufacture, prospects for the development of information technologies in the production and operation systems of transport and technological machines and complexes.

KNOWLEDGE, SKILLS AND ABILITIES AT THE END OF THE COURSE

As a resultof mastering the discipline, masters should::

know:

- design and calculation of technological machines, as well as basic computer programs used for static, dynamic and traction calculations of machines, as well as programs for strength frames ofmachine elements and components;
- stages of development of a Unified system of design documentation in accordance with GOST: technical proposal, draft design, technical design, working designdocumentation;

be able to:

-formulate a new product concept and basic technical requirements;

- carry out critical analysis of layout schemes, performadjustment work on machines, aggregates and components;
- perform drawings of parts and assembly units in accordance with the requirements for design documentation, includingusing three-dimensional computer modeling methods;
- identify the mechanisms and devices used in theconstruction of machines, if there is a drawing of them or a sample available for disassembly, and evaluate the main quality characteristics;

- analyze and evaluate the impact of the design on the operational properties of the units, select the parameters of the units in order to obtain optimal operational characteristics;

- choose rational schemes of automaticsystems and aggregates;

own:

- engineering terminology in the field of design andproduction of transport and technological machines;

- methods and skills of formulatinga new product concept and technical requirements;

- methods and skills of designing transport and technological machines, their aggregates and components, including using three-dimensional models;

- methods and skills for calculating typical components and parts, including calculation of electric, hydraulic and pneumatic drives and devices (graphical, analytical and numerical).

Intellectual Property Protection
CODE – TEC523
CREDIT – 6 (2/1/0)

The purpose of studying the discipline

Formation of undergraduates ' basic knowledge in the field of intellectual property, preparation of graduates to solve professional problems related to registration of rights to intellectual property objects and their protection, obtaining theoretical knowledge in the field of patenting and acquiring practical skills in the application of patent law as one of the components of intellectual property law in Kazakhstan, formation of modern scientific Outlook among undergraduates, familiarization with the methodology of scientific research. The main objectives of the discipline are: - Study of intellectual property objects and laws in the field of intellectual property protection; - Mastering the methods of protecting intellectual property rights, as well as the use of knowledge in the field of intellectual property in organizational, managerial, design and design activities;

KNOWLEDGE, SKILLS AND ABILITIES AT THE END OF THE COURSE

As a result of mastering the discipline, the master must: Know – - intellectual property objects – - rights and obligations of authors and owners of intellectual property objects; - ways to protect the rights of authors and owners of intellectual property objects; - legislation regulating relations in the field of intellectual property protection; - rules for registration of intellectual property rights; - major international organizations in the field of intellectual property protection; be Able to: - make applications for industrial property objects; - apply options for calculating the price of a license to use an industrial property object (primarily technical); - protect the rights of authors and owners of intellectual property objects; - conduct patent research; - use information resources of the FIPS; Own: - ideas about the legislation regulating relations in the field of intellectual property protection – rules for processing applications for industrial property objects; – methods for protecting intellectual property rights. - skills in conducting patent research.

Automated systems for solving logistics problems
CODE – TRA206
CREDIT – 6 (2/1/0)

COURSE GOALS AND OBJECTIVES

The purpose of mastering the discipline is to prepare undergraduates for the creation and application of modern intelligent automated systems, as well as to understand the importance of automated systems in solving modern logistics problems.;

Objectives of the discipline: introduction to modern CASE-software systems for automating the solution of logistics problems.

BRIEF DESCRIPTION OF THE COURSE

Content of the discipline. Corporate and transport logistics in examples and tasks. Specialized software for managinga logistics company. Principles of applying the lean manufacturing concept. Features of implementing the KANBAN system. The e-business platform mySAP Buisnes's Suite. Comprehensiveintegration platform SAP NetWeaver. Softwarelogistics based on the SAP platform. Use of automated technologies of the SAP platform for supply chain Management (SCM). Use of automated technologies of the SAP platform for customer relationship Management (CRM).

KNOWLEDGE, SKILLS AND ABILITIES AT THE END OF THE COURSE

As a result of studying the discipline, the master's student must::

know:

- approaches to solving logistics problems using modern automated systems;
- models and methods of formalized representation of logistics objects, technology for applying research and modeling automation tools required for solving logistics problems;
- basic concepts and principles of building automated systems of engineering analysis.

be able to: apply methods for representing logistics objects in modern automation systems.

possess: methods of solving logistics problems and skills of working in modernautomation tools.

Information and computer technologies in science and education
CODE – TRA226
CREDIT – 6 (2/1/0)

BRIEF DESCRIPTION OF THE COURSE

The discipline studies the following: experiment Planning. Experiment, observation(experience), experimental data-the main terms and conditions. The concept of an approximate number and error. Estimation of errors in the computational process. Mathematical model of the research object in the form of an algebraic power polynomial. Regression polynomials are an approximate reflection of the ideal mathematical model of the research object. A random variable in the processing of experimental data by regression analysis. (experiments) in the experiment. The variance of reproducibility. The concept of reliability of experimental data. Stochastic relationship between random variables. Conditions (prerequisites) for applying the regression analysis method. Regression polynomial and system of conditional equations. Transformation of a system of conditional equations using the Gauss method. Residual variance of the regression polynomial. Building an estimate and confidence area for the mathematical model of the research object. "Orthogonal" regression. Preliminary processing of experimental data. Exclusion of grossly erroneous data from the variation series.

Supply Chain Design for Production Systems
CODE – TRA221
CREDIT – 6 (2/1/0)

BRIEF DESCRIPTION OF THE COURSE

The content of the discipline: The basic principles of supply chain design. A systems approach and systems analysis in supply chain design. Modeling of objects and control subjects in production systems. Criteria for the quality and effectiveness of the supply chain. Methods and algorithms for supply chain design. Formation of the organizational structure of the supply chain. Evaluation of the effectiveness and efficiency of the supply chain of the production system.

Simulation modeling of logistics processes and systems
CODE – TRA455
Credit – 6 (2/1/0)

COURSE GOALS AND OBJECTIVES

When studying the discipline, the goal is to study the method and technologies of simulation modeling in application to the problems of managing logistics processes and systems.

BRIEF DESCRIPTION OF THE COURSE

When studying the discipline, the following aspects are considered: the Essence of the method of simulation modeling. The method of simulation modeling. Process-oriented discrete simulation models. Simulation technology: fundamentals of a practical approach. Simulation tools. Mastering the instrumental capabilities of modern modeling systems. The most significant applications of process simulation in logistics and supply chain management. Modeling and reengineering of logistics processes in supply chains. Simulation of logistics processes and systems.

KNOWLEDGE, SKILLS AND ABILITIES AT THE END OF THE COURSE

As a result of studying the discipline, the student must:
- explain the concept of simulation modeling;
- build a conceptual model
- apply the principles of simulation modeling;
- determine the nature of input and output data

Automation systems for road transport
CODE –TRA207
Credit – 6 (2/0/1)

COURSE GOALS AND OBJECTIVES

The goal is to form students ' clear understanding of the purpose and capabilities of automated control systems, to study the design procedure for automated enterprise management systems, to analyze issues related to the classification and definition of tasks of automated control systems.

Objectives of the course -and methods of calculation of indicators of efficiency of traffic organization; study methods for the control of traffic lights, monitoring transport and navigation; the study of modern computer technologies that implement mathematical modeling, collection and processing of information, preparation and registration of documents, design documents, using specialized programs, presentation of material in information networks modeling skills of various systems of automobile transport.

BRIEF DESCRIPTION OF THE COURSE

The discipline deals with issues describing the basics of modern mobile communication facilities, automation systems, design and use of databases, computer networks and communications, automated systems and transportation management, and mathematical methods for solving motor transport problems. Communication and the role of automation systems in the organization of transport service; information support of transport process; the purpose and types of systems and transport and their characteristics; the scope of application of the various communication systems in transport; the information flows in the transport systems, their interaction with the global system of communication, storage and processing; ACS as a tool for optimization of management processes in the transport system: structure and levels of building automated control systems for transport, their functions.

KNOWLEDGE, SKILLS AND ABILITIES AT THE END OF THE COURSE

As a result of mastering the discipline program, the master's student must:

Know:

- basic concepts, management tasks and methods of their solution in the system behavior,способы presentation sections;
- fundamentals of building and operating передачиdata transmission networks in transport;
- data network management system and information protection;
- network security management system.

Be able to:

- develop design diagrams of control systems and apply mathematical models to describe and study control systems;
- calculate the values of functions defined by analytical expressions, convert symbolic expressions;

- apply technical and software tools to solve problems in various subject areas;
- analyze data processing processes;
- interpret the results obtained in order to develop proposals for improving the functioning of networks.

Skills:

-mathematical apparatus and theoretical schemes used in the description and study of various modes in control systems; work with the main means of computer equipment and information technologies.

- basic concepts and terms of the discipline; skills in building and administering computer networks of various scales.

Innovative meehods for repairing machine parts
CODE – TEC533
Credit – 6 (2/0/1)

OBJECTIVES OF THE DEVELOPMENT OF DISCIPLINE

The purpose and objectives of the discipline is to provide the specialist with modern knowledge on the technology of restoring specific parts of equipment for mining, metallurgical and oil and gas production.

In the process of mastering this discipline the following tasks are solved:

- familiarization of undergraduates with the principles of choosing a rational technological process of restoring and hardening parts of mining, metallurgical and oil and gas production, depending on the type of wear;
- familiarization with innovative methods of restoring parts that have undergone wear, destruction and fatigue failure as a result of the operation of process equipment.
- to study and put into practice innovative principles, methods and tools for the development of the technological process of recovery and hardening;
- obtaining theoretical knowledge and practical skills in the selection of equipment and devices for the technological process being developed;
- the formation of skills for the rational use of basic and additional materials for the restoration and strengthening;
- Acquisition of practical skills in filling regulatory and technical and technological documentation for the repair and restoration of equipment parts.

KNOWLEDGE, SKILLS, SKILLS TO COMPLETE COURSE

As a result of studying this discipline, the undergraduate must:

Know:

- technical and economic basis for the selection of innovative methods and technologies for restoring and improving the wear resistance of equipment parts;
- Principles of use of materials to achieve maximum wear resistance for various types of wear;
- The main requirements of the regulatory and technical documentation for the restoration and hardening of parts and assemblies;
- Basic requirements for the safe conduct of repair and restoration works.

Be able to:

- choose modern low-waste, energy-saving and environmentally friendly machine-building technologies for restoring and hardening parts of oil and gas equipment;
- to develop technological processes of hardening or restoration of parts;
- choose the necessary equipment, tools and accessories;
- choose the main and auxiliary materials of parts and coatings;
- to determine and ensure manufacturability of parts during their restoration and hardening;
- to make technological and repair documentation;

- To conduct a feasibility study of the selected technology.

Own:

- skills in developing technological maps of restoration processes and improving the wear resistance of parts;
- practical skills of drawing up project and technical documentation;
- practical skills to verify compliance of the developed process with the requirements of standards, specifications and other regulatory documents

Innovative Technology in the Supply Chain
CODE – TRA230
Credit – 6 (2/1/0)

BRIEF DESCRIPTION OF THE COURSE

The content of the discipline: modern technologies based on the intermodal approach, and their use in logistics systems and supply chains. Modern intermodal transport technologies. The principles of increasing the reliability, stability and dynamism of supply chains based on innovative technologies. Modern mechanisms of digital transformation of logistics. The principles of digital management of supply chain processes and the main mechanisms for their implementation.

Supply Chain Modeling
CODE – TRA212
Credit – 4 (1/0/1)

COURSE GOALS AND OBJECTIVES

Objective: to study the theoretical and practical aspects of effective management of flow processes in supply chains, design of flexible and adaptive supply chains in various business areas.
The objectives of the discipline are to master the skills of applying logistics management and its tools for optimizing logistics processes in supply chains.

BRIEF DESCRIPTION OF THE COURSE

The discipline examines the evolution of logistics management of companies, the transition from logistics to supply chain management, the analysis of logistics concepts and strategies, understanding and highlighting logistics processes and key competencies in supply chains, the formation of logistics thinking and vision, the use of economic and mathematical methods, models and tools for optimizing the logistics chain by volume.

KNOWLEDGE, SKILLS AND ABILITIES AT THE END OF THE COURSE

As a result of mastering the discipline program, the master's student must::
Know:
- тtheoretical foundations of SCM functioning;
- fundamentals of system and process (process-oriented) approaches;
- business processes of the organization, internal and external supply chain, value chain;
- basic concepts of logistics (flows, logistics processes, logistics and functional cycles) and logistics management; concepts and strategies of logistics;
- тtrends in the development of global logistics and the functioning of global logistics chains;
-methods for optimizing logistics processes and supply chain management.
Be able to:
- design logistics processes at the level of supply chains and build the configuration of supply chains;
- apply scientific approaches, methods and principlesto supply chain research;
- analyze socio-economic literature in detail;
- apply system and process approaches;
- identify logistics processes at the supply chain level, as well as processes that do not create or reduce value;
- analyze and design logistics processes in the supply chain;
- perform logistics administration and supply chain design.
- apply relevant knowledge and make decisions in key areas of activity at the company level and at the level of supply chains.

Skills:

-mastering new material when performing individual tasks and independent work;

- professional argumentation and public statements in the process of research and analysis of logistics processes;

- methods of optimization; methods and techniques of negotiation.

- management of economic and mathematical tools and supply chain modeling.

Logistic tasks modeling
CODE-TRA227
Credit – 4 (1/0/1)

COURSE GOALS AND OBJECTIVES

The goal is to gain knowledge in the field, of modeling methods and solutions of logistics problems using mathematical models, to understand the role of individual elements of the structure of modeling problems, methods of their analysis and solution.
The objectives of the discipline are to improve and develop the ability to self-study new research methods, to change the scientific and scientific-production profile of their professional activities, to acquire independently with the help of information technologies and use them in solving professional problems based on knowledge of world trends in the development of computing technology and information technologies.

BRIEF DESCRIPTION OF THE COURSE

Sections of the discipline "Modeling in logistics problems": Characteristics and classification of optimization models. A systematic approach to optimization problems. Main classes of methods for solving optimization problems. Basic algorithms for solving optimization problems. Software implementation and testing of methods for solving optimization problems. Analysis of solutions and their practical implementation. Analysis of solutions for sensitivity to variations in the source data. Making optimal decisions in conditionsof uncertainty and multi-criteria in the process of its operation.

KNOWLEDGE, SKILLS AND ABILITIES AT THE END OF THE COURSE

As a result of mastering the discipline program, the master's student must::
Know:
- models of representation and methods of knowledge processing, decision-making systems;
- optimization and design decision-making methods.

Be able to:
- develop mathematical models of processes and objects, use methods of their research, perform their comparative analysis;
- apply these methods to solve logistics problems.

Skills:
-methods of analysis and methods of formalization of intellectual tasks using artificial intelligence languages;
- management and selection of optimal solutions using mathematical models of decision-makingin relation to logistics problems.

Strategic Supply Chain Management
CODE- TRA224
Credit – 6 (2/0/1)

BRIEF DESCRIPTION OF THE COURSE

The purpose of the discipline is to study methods of optimal inventory management using information systems.The content of the discipline: the basic concepts of inventory management and methods for their analysis. Supply chain inventory management strategies. Inventory formation mechanisms, principles and methods of inventory management in the supply chain. Models of optimal inventory levels. Management of the processes of inventory formation. Methods to reduce overall logistics costs and total costs in inventory management in the supply chain.Information systems and technologies for inventory management in the supply chain.

Electric machines
CODE - TRA209
CREDIT – 4 (2/0/1)

COURSE GOALS AND OBJECTIVES

The purpose of mastering the discipline "Electric machines" is to form a knowledge system for students to solve professional problems on mastering the skills of effective use of electric machines used in transport and technological machines and complexes.

To achieve this goal, when mastering the discipline, the following task is solved: studying the basics of the theory, device, working properties of electrical machines and their application areas.

BRIEF DESCRIPTION OF THE COURSE

Content of the discipline. Theory of the transformer. Electromagnetic processes in the transformer. Transformer power engineering. Special transformers. General information about electric machines. Asynchronous machines. Of the synchronous machine. AC collector machines. DC machines. Micromachines.

KNOWLEDGE, SKILLS AND ABILITIES AT THE END OF THE COURSE

As a result of studying the discipline, the master's student must know:

- methodology for conducting research to determine the parameters of working processes of electric machines;
- features of bench testing of electric machines;
- adjustment parameters of the maintypes of electric machines;

umet:

- conduct laboratory tests of electrical machines;
- draw up T - and L-shaped replacement schemes for electrical machines based on the tests carried out;
- configure the correct operating mode of transformers and electric motors during a pilot test;

vladet:

- skills in determining the real physical processes of electrical machines by analytical and/or graphoanalytic methods;
- skills in testing electrical machines in operation;
- ability to adjust electric machines to a given operating mode.

Modern transportation technologies in supply chains
CODE – TRA214
CREDIT – 4 (2/0/1)

COURSE GOALS AND OBJECTIVES

Goals of the discipline "Modern transportation technologies in supply chains" - an in-depth study and discussion ofspecific issues related to technologies, tools and methods of transportsupport for supply chains and modern transport infrastructure,

BRIEF DESCRIPTION OF THE COURSE

Content of the discipline.The concept of the basic vehicle of each generation . Examples of modern technological solutions in the field of logistics. Information tools for monitoring the operation of transport. Connection of the discipline with other professional and special disciplines. Innovations, technological resource, generations of technology. The concept of "innovation". Extensive and intensive development in the field of logistics. Indicators for assessing the technological resource of a country or enterprise. Investment in innovation. Change of generations of equipment and technologies in the field of logistics.High-quality model of generations of transport equipment. Life cycle of generations of trenchequipment and technology. Characteristics and basic directions of the scientific and technical-revolution(NTR). Features of 3NTR. Application of 3NTR achievements in logistics - nanotechnology, creation of control systems with artificial intelligence, new means of communication and energy transmission.Forecasting the development of logistics infrastructure. Study of the technical levelof logistics infrastructure elements. Assessment based on several quality indicators that determine the suitability of an infrastructure element tomeet the demand for its services. Development of a project to improve transportation technology.

KNOWLEDGE, SKILLS AND ABILITIES AT THE END OF THE COURSE

As a result of studying the discipline, the master's degree program should:

- know: characteristics, technological and economicfeatures of modern transport systems for various purposes; modern principles of organizing transport services for supply chains of various profiles;

- be able to: determine the goals and objectives of research, develop conceptual models, work plans and programs for conducting scientific research in the field of transport support for supply chains; work as part of project teams in the development of modern transport support systems for logistics;

- own: scientific and business discussions on logistics transportsupport.

Technological equipment and production and technical infrastructure of enterprises

CODE – TRA210

CREDIT – 6 (2/0/1)

COURSE GOALS AND OBJECTIVES

The purpose of mastering the discipline "Technological equipment and industrial and technical infrastructure of enterprises" is to form a system of competencies for students to solve professional problems related to the effective operation of technological equipment of automobile transport enterprises and service stations, design, reconstruction, technical re-equipment and general planning of the production and technical base of automobile transport enterprises.

To achieve this goal, the following tasks are solved when mastering the discipline::

- study of the main types of technological equipment and their classification;
- study of the features of the selection, installation and operation of equipment;
- study of the rules of maintenance and repair of technological equipment of automobile transport enterprises;
- mastering methods for calculating the volume of maintenance and repair of technological equipment;
- study of the state and ways of development of the production and technical base (PTB) of enterprises operating transport and transport-technological machines and equipment (Titma) industry;
- the study of basic management standards of operating companies of Titto industry;
- mastering the methodology of technological design of automobile transport enterprises, service stations, parking lots, gas stations;
- study of the main stages of development of projects for reconstruction, technical re-equipment and general layout of the PTB of enterprises operating tittmo in the industry;
- study and master the methodology of designing in-house communications
- study and master the methodology for determining the need for PTB enterprises in operational resources.

BRIEF DESCRIPTION OF THE COURSE

Content of the discipline: Technological equipment is an integral part of the PTB of automobile transport enterprises. Lifting, transport and disassembly equipment. Control and diagnostic equipment. Washing and refueling equipment. Equipment for body repairs and painting works. Equipment for wheel maintenance and repair. Selection purchase and installation of technological equipment. Technical operation of technological equipment. Repair of technological equipment. Metrological and environmental support of technological equipment. Trends in improving the design of technological equipment.

KNOWLEDGE, SKILLS AND ABILITIES AT THE END OF THE COURSE

As a result of studying the discipline, the student must::

know:

- about basic technological and diagnostic equipment and tooling for maintenance and TP operations, about equipping work stations and workplaces;
- classification and assignment of technological equipment used in maintenance and trtitmo of the industry;
- schematic diagrams, device, technical level and characteristics of the equipment included in each classification group repair, tire repair, special tools for maintenance and TP);
- features of selection, acceptance, and installation of technological equipment;
- basic rules for safe operation of technological equipment;
- ensuring the environmental safety of equipment at operational enterprises;
- about methods of maintaining equipment in a technically sound condition;
- technologies of metrological verification of diagnostic equipment and devices used at operational enterprises of the industry;
- basic requirements and principles of the organization of the quality management system for the operation of technological equipment;
- rules for maintaining operational documentation for technological equipment;
- methods for determining the need for PTB enterprises in operational resources and technological equipment;
- fundamentals of designing in-house communications.

state of the art, forms and ways of development of PTB enterprises operating Titto industry;

- basic control standards of enterprises for the operation of Titto industry;
- features and main stages of development of reconstruction and technical re-equipment projects;
- principles of organization of transport processes to provide the necessary resources for road transport enterprises;
- basic requirements and rules for installation and adjustment of engineering systems of automobile transport enterprises;
- criteria and standards for the selectionof technological equipment;

be able to:

- perform diagnostics and analysis of the causes of malfunctions, failures and breakdowns of parts and components of technological equipment;
- organize the operation of technological equipment of motor transport enterprises in accordance with the established requirements;
- organize technical inspection and maintenance of technological equipment;
- use the existing regulatory, technical and reference documentation;
- calculate the company's need for energy resources;
- calculate the production program for vehicle maintenance and diagnostics;

- calculate the number of employees, the number of jobs and select the necessary technological equipment;
- make selection, placement and placement of technological equipment;

own:

- skills of organization of technical operation of technological equipment of motor transport enterprises and car service stations;
- skills of acceptance of the introduced technological equipment;
- the skills of calculating the storage depots of the enterprises of motor transport;
- the method of selecting, arranging and placing technological equipment.

Research and testing of transport and transport-technological machines
CODE – TRA204
CREDIT – 6 (2/0/1)

COURSE GOALS AND OBJECTIVES

The purpose of the discipline is to develop a system of scientific and professional knowledge and skills in the field of research and testing of ground transport and technological machines, allowing students to independently organize research and testing of lifting and transport, construction, road machinery and equipment, taking into account technical, technological, economic and environmental factors.

The main objectives of studying the discipline are:

- study of methods and techniques for research and testing of ground transport and technological machines and their components;
- study of the principles of selection of devices and equipment for research and testing of ground transport and technological machines and their components;
- study of the principles of development of technologies for research and testing of ground transport and technological machines and their components;
- creationof the foundations of broad theoretical training in the field of research and testing of ground transport and technological machines for undergraduates, which allows future masters to navigate the flow of scientific and technical information and provides them with the opportunity to use the achievements of scientific and technological progress in their practical activities;
- familiarizing undergraduates with the organization of advanced technological processes of research and testing of ground transport and technological machines using modern technological equipment and developing undergraduates ' techniques and skills in solving engineering problems based on alternative approaches using experiment, mathematical methods and computer technology;
- mastering and understanding of regulatory and technical documentation and laws applicable in the industry by undergraduates;
-mastering the methods of research and testing of ground-based transport and technological machines of ground-based transport and technological machines.

BRIEF DESCRIPTION OF THE COURSE

Content of the discipline: Basic requirements for the design and reliability of transport and technological machines and equipment of machines. Experimental determination of structural and operational properties of machines. Laboratory, factory, operational (industrial), running, road emissions. Cargo tests. Acceptance-, control, and research tests of machines are carried out.Testing of mass-produced and experimental vehicles with transport system life cycles. Test equipment and stands. The methodology of the testing machines.Investigation of starting properties, maneuverability, performance, and thermal conditions. Determination of dynamic and traction properties, durability and strength of machines and their components. Evaluation of the economic

efficiency of implementing machines. Testing of machines in emergency mode. Certification tests of machines. Refinement of vehicles based on test results. Testing of power plants and machine drives. Testing of electrical machines. Testing of machines for reliability. Registration of machine test results.

KNOWLEDGE, SKILLS AND ABILITIES AT THE END OF THE COURSE

As a result of studying the discipline, the master must::

know:

- methods and methods of research and testing of ground transport and technological machines and their components;
- instruments and equipment for research and testing of ground transport and technological machines and their components;
- technology of research and testing of ground transport and technological machines and their components;

be able to:

- apply methods of research and testing of ground transport and technological machines of ground transport and technological machines;

have the following skills:

- independently prepare all transport and technological machines and their components for research and testing;
- plan research and testing of transport and technological machines and their components;
- use modern equipment, stands and scientific equipment for conducting research and testing of transport and technological machines and their components, as well as processing the results obtained;
- process and analyze materials and results of research and testing of transportand technological machines and their components.

Fundamentals of the performance of technical systems
CODE – TRA213
CREDIT – 4 (1/0/1)

COURSE GOALS AND OBJECTIVES

The purpose of mastering the discipline "Fundamentals of technical systems operability" is to form a set of competencies for students to solve professional tasks to ensure the operability of technical systems in the process of their functioning.

Tasks:

- study of the basic principles of building, functioning and ensuring the operability of technical systems;
- study of the cause of reduced performance of technical systems;
- study of the main directions that allow ensuring the operability of objects at a sufficient level;
- study of the function of the engineering and technical service of operational enterprises of the industry in the framework of ensuring the operabilityof technical systems.

BRIEF DESCRIPTION OF THE COURSE

Content of the discipline: Fundamentals of building and functioning of complex technical systems, basic concepts and characteristics. Trends in the development, growth of functionality and complexity of technical systems that provide transport technologies. The main directions of development of the transport complex of the industry, taking into account the use of information technologies. Regulatory and technical documentation (regulations, industry standards, technical rules and requirements) that defines the procedure for the development, implementation and operation of modern technical systems. Features of managing technical systems. Fundamentals of industrial operation and maintenance of technical systems in the industry. Reasons for reducing the efficiency of machines in operation. Influence of the shape and physical and mechanical properties of working surfaces on the performance of machine parts. Factors influencing the nature of interaction between the working surfaces of machine parts. Types of wear. The influence of lubricants on the performance of machines. Fatigue of materials of machine elements. Corrosion damage of machine parts. Program for ensuring the operability of technical systems. Fundamentals of the concept of "life cycle of technical systems". The evaluation of performance of machine elements. Determination of performance indicators for machine elements. Operability of the main elements of technical systems. Functions of the engineering and technical service of operational enterprises of the industry in the framework of the operation of technical systems to maintain their operability.

KNOWLEDGE, SKILLS AND ABILITIES AT THE END OF THE COURSE

As a result of studying the discipline, the student must::

know:

- fundamentals of industrial operation and maintenance of technical systems in the industry;
- the main directions that make it possible to ensure the operability of objects at a sufficient level;
- functions of the engineering and technical service of operational enterprises of the industry within the framework of the operation of technical systems to maintain their operability;
- causes of reduced machine performance in operation, types and general patterns of wear;
- ways to determine the health of various machine elements;
- fundamentals of developing a program to ensure the operability of the main elements of technical systems;
- regulatory and technical documentation defining the procedure for selecting measures to maintain and restore the operability of various machine elements;

be able to:

- technically competent use of regulatory and technical documentation that defines the operation procedure for modern technical systems;
- evaluate factors that affect the loss of working capacity.;
- apply methods for determining the performance of the power plant, transmission elements, chassis elements, electrical equipment of machines;
- apply methods for selecting rational forms of maintaining and restoring the operability of various machine elements;

own:

- skills in determining the performance indicators of machine elements;
- skills in determining rational forms of maintaining and restoring the operability of various machine elements.

Registration and defense of the master's thesis
CODE – ECA205
CREDIT –12

The purpose of completing a master's thesis is to:

demonstration of the level of scientific/research qualification of the master's student, the ability to independently conduct scientific research, test the ability to solve specific scientific and practical problems, knowledge of the most common methods and methods of solving them.

BRIEF DESCRIPTION

Master thesis – graduation qualification scientific work, by providing a generalization of the results independent of researches one of the urgent problems of a particular specialty of matching science that has internal unity and reflects the progress and results of elaborated topics.

Master's thesis – the result of research/experimental research work of the master's student, conducted during the entire period of study of the candidate.

Master's thesis defense is the final stage of master's degree preparation. A master's thesis must meet the following requirements:

– the work should conduct research or solve current problems in the field of technology and automation of transport and transport systems;

- the work should be based on identifying important scientific problems and solving them;

- decisions must be scientifically based and reliable, have internal unity;

- the dissertation work must be written individually.

Contents	