

APPROVED

«Автоматтан» Директор of the A&T Institute  
 Тоғоғзинова А.  
 2023

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Институт «Автоматтан»  
и телекоммуникации»

CATALOG OF ELECTIVE DISCIPLINES

EDUCATIONAL PROGRAM  
 Education level: master's degree

7M07143 – Management of technological complexes  
 Study period: 1,5 years

Year of admission: 2023

Module	Cycle	Component	Name of the discipline	Total labor intensity		Term	Educational outcomes	Brief description of the discipline	Prerequisites	Post-requirements
				in academic hours	in academic credits					
Module 5 – Professional competencies	BD	EC	Lean manufacturing	270	9	2	EO4	Studies the basics of organization management based on the principles of lean production: minimizing all types of losses in the course of activity, achieving the maximum possible result in the shortest possible period of time, rational use of all types of resources, improving aspects of the organization's activities, involving employees in technological processes; formation of lean thinking among future managers, correlated with the ideas of concepts relevant to the modern world sustainable development and conscious consumption.	Operational reliability of automation and telemechanics devices/Reliability of automation systems in transport	Manufacturing practice, Final certification
			SMART technologies in transport				EO4	The intellectual technologies used in railway transport are considered and studied. The basic concepts of the current state and prospects for the development of railway transport infrastructure based on SMART technologies are described. Familiarization of students and the formation of skills for assessing the improvement of operational safety of railway infrastructure facilities, taking into account the development of computer technologies, software and artificial intelligence. Active teaching methods and brainstorming are used.	Local automation and control systems	Manufacturing practice, Final certification
	PD	EC	Operational reliability of automation and telemechanics devices	270	9	1	EO5	It is aimed at studying the theoretical and methodological foundations of automation and telemechanics devices and systems, the basic definitions and concepts of the theory of operational reliability, taking into account the methodology of train safety evidence. Solution of issues of certification of devices and calculations of the price of failures. Within the framework of the discipline, active teaching methods are used: teamwork, role-playing games, brainstorming ("brain attack"), express survey.	Bachelor's degree disciplines	Manufacturing practice, Final certification
			Reliability of automation systems in transport				EO5	Studies the basic concepts and terms of reliability theory and the science of technical cybernetics, which find direct applications in devices and automation systems in transport. Solves practical tasks to determine the main indicators of system reliability, taking into account the experience of operating devices in accordance with the requirements of train safety. Within the framework of the discipline, active teaching methods are used: teamwork, role-playing games, brainstorming ("brain attack"), express survey.	Bachelor's degree disciplines	Manufacturing practice, Final certification
	PD	EC	DC computer systems	180	6	2	EO8	Forms knowledge about the organization, purpose and principle of operation of modern microprocessor systems of dispatching control and control in railway transport. The basics of technology and features of the use of various dispatch centralization systems are studied, taking into account the volume of traffic and ensuring traffic safety issues. Within the framework of the discipline, guest lectures by leading top managers of production are provided.	Operational reliability of automation and telemechanics devices/Reliability of automation systems in transport	Manufacturing practice, Final certification



	PD	EC	Automated Remote Control and Telesignalization systems				EO8	Mastering professional skills in the field of control control systems in railway transport. The discipline covers the issues of the purpose of the device and the principles of operation of modern automated systems of remote control and control of objects at the station and stage. Within the framework of the discipline, guest lectures by leading top managers of production are provided.	Operational reliability of automation and telemechanics devices/Reliability of automation systems in transport	Manufacturing practice, Final certification
	PD	EC	Microprocessor systems at the stations	180	6	1	EO5, EO8	Intelligent technologies used in railway transport, in particular at stations with various electrical centralization systems, including microprocessor ones, are considered. Modern methods of using microprocessor equipment are studied in compliance with the requirements of safety guarantees. The discipline uses interactive teaching methods, case methods, role-playing games, group work.	Bachelor's degree disciplines	Manufacturing practice, Final certification
			Station devices and SCB systems				EO5, EO8	The main provisions and requirements for various electrical centralization systems at stations are studied. The element base and the sequence of actions to ensure the capacity of stations, sorting slides in accordance with the rules of technical operation. The discipline uses interactive teaching methods, case methods, role-playing games, group work.	Bachelor's degree disciplines	Manufacturing practice, Final certification
	PD	EC	Systems of interval regulation of train traffic	180	6	2	EO7	Forms knowledge about the organization and purpose of systems of interval regulation of train traffic on stages, the main elements and devices of systems, issues of ensuring the safety of the functioning of automatics and telemechanics devices. The methods of maintenance of distillation and moving systems, as well as automatic locomotive signaling are being studied. The discipline provides for solving practical problems using active teaching methods, role-playing games, group work.	Operational reliability of automation and telemechanics devices/Reliability of automation systems in transport	Manufacturing practice, Final certification
			Track blocking and auto-regulation				EO7	The discipline covers the organization and arrangement of various systems of track blocking and auto-regulation on stages. Methods of maintenance and adjustment of operated and prospective automatic and semi-automatic locking systems. Solves the issues of ensuring the safety of train traffic at the intersection of railways with automobile. The discipline provides for solving practical problems using active teaching methods, role-playing games, group work.	Operational reliability of automation and telemechanics devices/Reliability of automation systems in transport	Manufacturing practice, Final certification
Total				1080	36					

Head of the «Automation and Control» Department

AGREED:

Chief engineer of Almaty signaling and communication distance (Shch-33)



*Handwritten signature in blue ink, appearing to be 'K. Sansybay'.*

K. Sansybay

B. Akhmiev

30.03.2023