



**CATALOG OF ELECTIVE DISCIPLINES**

**EDUCATIONAL PROGRAM**

**7M07144 –Automation and control**

**Education level: master's degree**

**Study period: 2 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	Digital automated systems in railway transport	270	9	1	EO4	The discipline is aimed at studying the principles of building digital automated systems used in railway transport. This course forms students' knowledge, skills and abilities in the field of maintenance of digital systems of electrical and dispatching centralization, as well as systems of interval regulation of train traffic.	BD, PD of the bachelor's cycle	Manufacturing practice, Final certification
			Information security of automated systems				EO4	The discipline is aimed at studying the basics of designing an integrated information security system of automated systems, mastering ways to isolate information in automated systems that is subject to protection, as well as studying the criteria for the security of automated systems and the methodology for building modern information security systems.		
	BD	EC	Strategic management	180	6	2	EO1	Formation of undergraduates' basic theoretical knowledge and basic practical skills in the field of strategic management of enterprises and organizations, strategic analysis of the external and internal environment of the company, the company's competitive strategy and corporate management strategy.	BD of the bachelor's cycle	Final certification
			Business research				EO1	Mastering theory by undergraduates, as well as developing practical skills in business research and analytics, life cycle analysis of the development of promising technologies. The scientific and technical aspects of the project are being studied.		
	PD	EC	Diagnostics and monitoring of RAT devices	180	6	3	EO6	The purpose of this discipline is to study the principles of building systems for diagnosing and monitoring railway automation and telemechanics devices. The methods of organizing self-diagnosis in systems, issues of improving the reliability of the functioning of equipment of railway automation and telemechanics systems due to the organization of technical diagnostics are considered.	Uninterruptible power supply systems for automatic devices	Final certification
			Microprocessor systems for diagnosing RAT devices				EO6	The discipline is aimed at studying the principles of constructing microprocessor systems for diagnosing railway automation and telemechanics devices. The role functions of nodes and circuit diagrams of microprocessors directly related to the diagnosis of devices and systems of railway automation are investigated. The methods of monitoring the parameters of SCB devices in various microprocessor diagnostic systems are considered.		
PD	EC	DC computer systems	180	6	2	EO8	The discipline is aimed at studying the principles of building a new generation of operational dispatch control systems. The issues of the organization of automated workplaces of train dispatchers, the study of the element base of computer systems of dispatching centralization, as well as methods of organization of management and control of remote control facilities are considered.	Operational reliability of automation and telemechanics devices/Reliability of automation systems in transport	Manufacturing practice, Final certification	



			Automated Remote Control and Telesignalization systems				EO8	The discipline is aimed at studying the principles of building automated dispatch centralization systems. The methods of organizing the transmission of remote control and telesignalization signals, methods of transmitting responsible commands for remote control and control of railway automation and telemechanics facilities are considered.	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	The discipline focuses on the study of the principles of construction of relay-processor and microprocessor systems of automation and telemechanics used at stations. The course forms the skills of designing various relay-processor and microprocessor systems at stations, as well as reading electrical circuit diagrams for controlling arrows and signals when using these systems.	Bachelor's degree disciplines	Manufacturing practice, Final certification
			Station devices and SCB systems				EO5, EO8	The requirements for various electrical centralization systems at stations, their element base and the sequence of actions to ensure the capacity of the station, sorting slides in accordance with the rules of technical operation are investigated. The discipline uses interactive teaching methods, case methods, role-playing games, group work.		
	PD	EC	Systems of interval regulation of train traffic	180	6	2	EO7	The discipline is aimed at studying the principles of constructing systems of interval regulation of train traffic. Develops skills in designing devices and auto-locking systems. The basic schemes of changing the direction of movement of trains on stages, as well as methods of dispatching control of distillation devices and systems are investigated.	Theory and operational reliability of automation and telemechanics devices /Reliability of automation systems in transport Bachelor's degree disciplines	Manufacturing practice, Final certification
			Track blocking and auto-regulation				EO7	The discipline is aimed at studying the principles of building systems of semi-auto-locking, auto-locking and radio-blocking. The course forms the skills of designing systems for interval control of the movement of new generation trains, track plans of crossings and reading electrical circuit diagrams of auto-locking.	Operational reliability of automation and telemechanics devices/Reliability of automation systems in transport Bachelor's degree disciplines	Manufacturing practice, Final certification
	PD	EC	Artificial intelligence in transport	180	9	3	EO8	The purpose of this discipline is to master the principles of organization and functioning of intelligent systems, as well as to gain practical skills in their design. The ways of using tools and technologies for designing artificial intelligence systems for railway automation and telemechanics are considered.	Digital automated systems in railway transport Information security of automated systems	Manufacturing practice, Final certification
			Cloud Computing Infrastructure				EO8	The discipline is aimed at studying the architecture of "cloud" technologies, designing "cloud" services, as well as gaining skills in application development for the main existing "cloud" platforms. The main characteristics of "cloud" technologies, methods of assessing the benefits and risks associated with the use of "cloud" computing are considered.	Digital automated systems in railway transport Information security of automated systems	Manufacturing practice, Final certification
<b>Total</b>				<b>1440</b>	<b>48</b>					

Head of the «Automation and Control» Department

AGREED:

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

  
30.03.23

K. Sansyzbay



  
30.03.23

B. Akhmiev