



AGREED
Chairman of the Board of
Directors of Almaty Ventilation
Plant LLP
Bakkulov M.S.
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9. CATALOG OF DISCIPLINES OF THE OPTIONAL COMPONENT

EDUCATIONAL PROGRAM

6B11236 –«Occupational safety and environmental protection in transport »

Level of education: bachelor's degree

Training period: 4 years

Year of admission: 2023

Cycle	Component	Name of the discipline	General labor intensity		Semester	Learning Outcomes	Brief description of the discipline	Prerequisites	Postrequisites
			in academic hours	in academic credits					
1	2	3	4	5	6	7	8	9	10
GED	EC1	Ecology and Life Safety	150	5	3	LO 4	The study of the basic environmental concepts, environmental problems and approaches to their solution, sources and types of environmental pollution by enterprises, the principles of standardizing the quality of atmospheric air and water, the main provisions of legislation in various fields, natural and man-made emergencies, their causes, methods of prevention and protection . Teaching methods - analysis of specific situations (case-study), group discussions	Environmental chemistry	Fire safety, Geoecology, Ecology of the geosphere and its problems, Environmental safety in transport, Industrial ecology, Ecologization of energy sources, Chemmotology, Radiation safety of industrial facilities, Chemical and biological safety, Ways of survival and first aid
	EC 2	Methods of scientific				LO 1			

		research					study, training of specialists with the skills of cognitive activity in the field of science, the formation of deep ideas about the content of scientific activity, its methods and forms of knowledge. Active learning methods - Group, scientific discussion, debate, project method	Module	practice 1, Production practice 2, Final certification
	EC 3	Fundamentals of Economics and Entrepreneurship				LO 2, LO 8	Formation of analytical thinking skills in the implementation of conclusions on economic issues; the ability to independently draw conclusions on the basis of the studied material; navigate in any economic situations, apply theoretical economic knowledge in practice, realize their abilities, both in a personal and professional direction. Active learning methods - business and role-playing games	Socio-Political Knowledge Module	Management Economics (Minor 1), Time Management (Minor 2)
	EC 4	Fundamentals of law and anti-corruption culture				LO 8, LO 9	Improving the public and individual legal awareness and legal culture of students, as well as the formation of a system of knowledge and civil position to combat corruption as an anti-social phenomenon. As a result of studying the course, the student must master the fundamental concepts of law, the constitutional structure of the state power of the Republic of Kazakhstan, the rights and freedoms of citizens enshrined in the Constitution, the mechanism and protection of the legitimate interests of a person in case of their violation. Active learning methods - case studies, brainstorming	Socio-Political Knowledge Module	Labor and environmental legislation, Management economics (Minor 1), Time management (Minor 2)
BD	EC 5	Geoecology	270	9	4	LO 6	Interdisciplinary scientific direction combining studies of the composition, structure, properties, processes, physical and geochemical fields of the Earth's geospheres as a habitat for humans and other organisms. The direction of science on the integration of geospheres and society, on the influence of man on the state of the atmosphere, hydrosphere, lithosphere, biosphere, on the structure and qualitative and quantitative composition of the geospheres of the Earth	Environmental Chemistry, Ecology and Life Safety	Environmental monitoring
	EC 6	Ecology of the geosphere and its problems				LO 6	Forms a holistic idea among students about the structure and connection of the geosphere shells of planet Earth, gives a complex of scientific knowledge about the geospheres of the Earth, their geological role, environmental functions, consequences arising from their interaction with each other and in contact with the technosphere, traces the dynamics of processes occurring within geospheres, and also considers ways to solve problems at the geosphere level, in order to	Environmental Chemistry, Ecology and Life Safety	Environmental monitoring

							preserve a productive natural environment for the current and future generation.		
BD	EC B7	Environmental safety in transport	180	6	4	LO 6	The discipline considers the main sources of environmental pollution by road and railway transport enterprises, methods for reducing the harmful impact of transport on the environment and methods for cleaning waste gases and wastewater from transport enterprises, methods for reducing noise. Economic basis and management of environmental protection at transport enterprises.	Environmental Chemistry, Ecology and Life Safety	Ecologization of energy sources, Chemmotology, Resource saving in transport (Minor 1) Wastewater treatment and MPD, Air basin protection and MPV, Chemical and biological safety, Utilization and processing of secondary resources
	EC 8	Industrial ecology				LO 5, LO 6	The discipline deals with the harmful effects of industrial enterprises on the environment, the causes of the harmful effects of transport, metallurgy, chemical industry enterprises and the main ways and methods to reduce the negative impact on the environment. Economic fundamentals and environmental management in the operation of industrial enterprises	Ecology and life safety	Resource saving in transport (Minor 1), Main objects of biotechnology (Minor 1) Wastewater treatment and MPD, Air basin protection and MPV, Chemical and biological safety, Utilization and processing of secondary resources, Industrial токсикология
BD	EC 9	Greening energy sources	180	6	6	LO 2, LO 6	The discipline considers the main alternative energy sources, wind, sun, etc., modern environmental requirements for the quality of fuels and lubricating oils in the Republic of Kazakhstan and abroad, the nomenclature and range of fuels and lubricants. Methods of production and environmentally friendly methods of combustion of solid and liquid fuels. Main physical and chemical properties of solid, liquid and gaseous fuels. Impact of quality of fuels and lubricants on environmental pollution	Analytical chemistry, Ecology and life safety, Environmental safety in transport, Utilization and processing of secondary ресурсов	Fire safety, Resource saving in transport (Minor 1)

	EC 10	Himmotology				LO 6	The discipline outlines the main modern environmental requirements for the quality of fuels and lubricants for transport engines, the properties of liquid and gaseous fuels, and methods for their production. Oil refining products, features of obtaining more environmentally friendly fuels. Alternative fuels for internal combustion engines. The influence of the quality of fuels and lubricants for transport engines on environmental pollution, alternative types of fuels for transport engines	Analytical chemistry, Ecology and life safety, Environmental safety in transport	Fire safety, Resource saving in transport (Minor 1)
BD	EC 11	Labor safety at transport enterprises	180	6	6	LO 7	Examines the fundamentals of the theory and practice of occupational safety to ensure occupational safety, preserve the life and health of workers, reduce the number of accidents and diseases at transport enterprises. The factors affecting working conditions and safety, personal protective equipment, first aid to victims are described. Basic information about safety during repair and other types of work at transport enterprises.	Labor and environmental legislation, Electrical safety and lightning protection, Safe operation of electrical circuits Ways of survival and first aid, Industrial sanitation and ergonomics	Fire safety, System of organization and management of labor protection
	EC 12	Safety in construction and transport organizations				LO 7	The organizational, technical and sanitary and hygienic measures to protect personnel and ensure safety, both at transport construction enterprises and in the performance of various types of work, are considered; the basis of safety in the construction, repair and maintenance of roads and railways. The construction of buildings and structures affecting the conditions and safety of work, means of individual protection, first aid for victims.	Labor and environmental legislation, Electrical safety and lightning protection Safe operation of electrical circuits, Ways of survival and first aid, Industrial sanitation and ergonomics	Fire safety, System of organization and management of labor protection
BD	EC 13	Electrical safety and lightning protection	180	6	5	LO 2, LO 3	The discipline sets out the causes of electrical injuries, factors affecting the degree of electric shock, organization of the safe operation of electrical installations, prevention of electrical injuries, protection against fires and explosions in electrical installations, medical and organizational measures for first aid in case of electrical shocks, lightning protection devices, protection against static electricity and	Applied Physics, Electrical Engineering and Fundamentals of Electronics	Applied Physics, Electrical Engineering and Fundamentals of Electronics

						electromagnetic fields.			
	EC 14	Safe operation of electrical circuits				LO 2, LO 3	The discipline sets out the basic rules for the operation and maintenance of electrical installations, including high-voltage power lines, the causes of electrical injuries, factors affecting the degree of electric shock, organizational and technical measures to protect personnel from electric current, first aid measures for electrical injuries.	Applied Physics, Electrical Engineering and Fundamentals of Electronics	Labor safety at transport enterprises, Safety in construction and transport organizations
BD	EC 15	Environmental monitoring	180	6	5	PO5	The discipline outlines the purpose of monitoring and its classification. Types of environmental monitoring; systems of methods of observation and control of environmental monitoring; requirements for the quality of the environment; fundamentals of biomonitoring and its place in the assessment of environmental quality. Methods for sampling water, air, soil, instruments and equipment for analysis are being studied.	Chemistry of the environment Methods and means of measurement control, Geoecology, Ecology of the geosphere and its problems	Wastewater treatment and discharge limits, Air basin protection and emission limits
	EC 16	Industrial monitoring				LO 5	The discipline outlines the main methods of monitoring compliance with environmental requirements by enterprises. Assessment of the negative impact of enterprises (mainly transport) on the quality of the environment. Types of observations of the quality of the air and water environment, water bodies and protected areas. systems of methods of observation and ground support, feedback and control, methods of control of estimation and forecast.	Methods and means of measurement control, Labor and environmental legislation	Wastewater treatment and discharge limits, Air basin protection and emission limits, Industrial toxicology
MD	EC 17	Industrial ventilation	180	6	7	LO 3, LO 7, LO 8	It studies general information about ventilation, ventilation tasks, characteristics of the microclimate of the working area, aerodynamics of ventilation flows, basic laws of aerodynamics. As well as types of air flows, resistance coefficients, characteristics of air ducts. Fundamentals of aerodynamic modeling of ventilation flows, natural thrust, its characteristics and calculation methods. Fans, their classification and characteristics.	Applied Physics, Industrial Sanitation and Ergonomics	final examination
	EC 18	Industrial toxicology				LO 4	It is the basic discipline of the elective component. The discipline studies hazardous chemicals, potent chemical toxic substances. chemical, physical and physico-chemical processes underlying their application and use in various production processes. Expert assessments and management in the field of chemical safety Basic concepts of "green"	Methods and means of measurement control, Analytical chemistry, Labor and environmental	final examination

							chemistry, the creation of new medicines. Methods of prevention and protection from the harmful effects of toxic harmful substances.	legislation Industrial ecology Industrial sanitation and ergonomics Industrial monitoring	
MD	EC 19	Radiation safety of industrial facilities	270	9	7	LO 3, LO 4	The discipline is the basic discipline of the university component. The discipline considers X-ray and gamma radiation of radioactive substances; cosmic radiation radiation of radioactive isotopes of natural and artificial origin; types and effects of radioactive radiation on living organisms radioactive waste and disposal problems, units of electromagnetic radiation, control over the radioactive state of the environment, personal protective equipment	Applied physics Methods and means of measurement control, Labor and environmental legislation, Ecology and life safety	final examination я
	EC 20	Chemical and biological safety				LO 3, LO 4	t studies the latest achievements in the field of chemical safety. Waste of transport enterprises, mechanisms of exposure to chemical, hazardous production factors, methods of their neutralization and neutralization Purpose - to give the student a holistic assessment of the content of chemicals in the industrial zone and in the disaster zone, as well as for eco-analytical monitoring of environmental objects.	Methods and means of measurement control, Analytical chemistry, Labor and environmental legislation, Ecology and life safety, Environmental safety in transport, Industrial ecology	final examination
MD	EC B21	Ways to survive and provide first aid	180	6	5	LO 4	The discipline considers the basics of a healthy lifestyle, ways of surviving in conditions of autonomous existence and providing first aid for various injuries, diseases, poisonings, allergic reactions, foreign bodies, psychological assistance, rules for applying bandages and resuscitation, general rules for caring for the injured and sick	Ecology and life safety	Labor safety at transport enterprises, Safety in construction and transport organizations
	EC 22	Utilization and processing of secondary resources				LO 2	Formation of competencies aimed at increasing the resource and energy saving capacity of technologies through the use of waste as secondary raw materials, which is in line with the current global trend of transition to a circular economy.	Analytical chemistry, Environmental safety in transport,	Greening energy sources

						Teaching methods are: problem solving, holding thematic colloquia, seminars. The form of control is a combined exam.	Industrial ecology		
	EC 23	Managerial Economics (Minor 1)	90	3	5	LO 2, LO 8	Formation of the conceptual apparatus and development of economic analysis skills using modern models and laws of economic science, consideration of economic problems and tasks facing the head of the company. The study of this discipline will allow students to gain and develop knowledge in the field of analytical research of economic, technological and technical parameters of an enterprise, and will also allow them to master the skills of applying special methods of economic justification of management decisions and assessing their consequences. Active learning methods are used - situational tasks, case method. Form of control - oral exam	Fundamentals of Economics and Entrepreneurship, Fundamentals of Law and Anti-Corruption Culture	final examination
	EC 24	Time management (Minor 2)				LO2, LO 8	Formation of students' general ideas about the essence and types of time management, principles and methods of time resource management for more successful implementation of professional activities. Methods of active learning are used - situational tasks, case method. The form of control is an individual project.	Fundamentals of Economics and Entrepreneurship, Fundamentals of Law and Anti-Corruption Culture	final examination
	EC 25	The main objects of biotechnology (Minor 1)	90	3	6	LO 2, LO 4	Formation of modern ideas among students receiving biological education about the objects of biotechnology at different levels of development, as well as about the basic principles and approaches used for their effective use in various fields of biotechnological production. The form of control is an individual project.	Environmental Chemistry, Industrial Ecology	final examination
	EC 26	EIA software (Minor 2)				LO 1, LO 10	Formation of students' knowledge base and teach the principles and methods of assessing the impact of various types of economic and other activities on the environment.	Fundamentals of computer modeling	final examination
	EC 27	Resource saving in transport (Minor 1)	90	3	7	LO 2, LO 8	Formation of students' general ideas about the essence and types of time management, principles and methods of time resource management for more successful professional activities. Active learning methods are used - situational	Environmental safety in transport, chemmology, ecologization of	final examination

						tasks, case method. Form of control - individual project	energy sources	
	EC 28	PowerBI Business Analytics (Minor 2)			LO 2	The course introduces the basics of data analysis using the Power BI tool. Power BI is a comprehensive solution for business analysis and data visualization from Microsoft. The program allows you to present all the organization's data on a single dashboard, analyze heterogeneous information and turn it into expressive interactive reports that can be shared with other users.	Engineering Mathematics, Fundamentals of Computer Modeling	final examination
Total			1950	68				

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