Institute of Architecture and Construction named after T. Basenov

Department of Engineering Systems and Networks

EDUCATIONAL PROGRAM
7M11202 «HYGIENE AND LABOR PROTECTION IN PRODUCTION»

Code and classification of the field of education	**7M11 Services**
Code and classification of training areas	**7M112 Hygiene and labor protection in production**
Group of educational programs	**M150 Sanitary and preventive measures**
Level according to NQF	**7**
Level according to ORK	**7**
Duration of study	**1.5 years**
Amount of credits	**90**

Almaty 2025

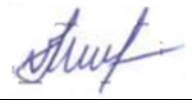
Educational program 7M11202 Hygiene and labor protection in productionwas approved at the meeting of K.I. Satbayev KazNRTU Academic Council

Minutes # 10 dated «06» Mart 2025.

was reviewed and recommended for approval at the meeting of K.I. Satbayev KazNRTU Educational and Methodological Council

Minutes # 3 dated 20. 12. 2024.

Educational program 7M11202 Hygiene and labor protection in production was developed by the academic committee in the direction of "Industrial safety and protection in emergency situations"

Full name	Academic degree/ academic title	Position	Workplace	Signature
Chairperson of Academic Committee:				
Alimova K.K.	cand.tech.science	Head of chair, assoc.prof.	KazNRTU named K.I.Satbayev	
Teaching staff:				
Nuruldayeva G.Zh	cand.tech.science	assoc.prof.	KazNRTU named K.I.Satbayev	
Shevtsova V.S.	cand.tech.science	assoc.prof.	KazNRTU named K.I.Satbayev	
Employers:				
Ensebayev B.K.		Vice-President	JSC "National Center for Scientific Research, Training and Education in the Field of Civil Protection"	
Students				
Emzhaev Zh.B.		Understudent, 2 course	Institute of high technologies KNU	

Contents

List of abbreviations and designations

NAO KazNITU named after K.I. Satpayev - NAO "Kazakh National Research Technical University named after K.I. Satpayev";

GOSO - State Compulsory Education Standard of the Republic of Kazakhstan;

OP - educational program;

IWS - independent work of a student (student, master's student, doctoral student);

SROP - independent work of a student with a teacher (independent work of a student (master's student, doctoral student) with a teacher);

RUP - working curriculum;

KED - catalog of elective disciplines;

VC - university component;

EC - optional component;

NQF - national qualifications framework;

ORK - sectoral qualifications framework;

RO - learning outcomes;

SDG - sustainable development goals.

1. Description of the educational program

The Master's degree program (hereinafter referred to as the EP) in the field of training 7M11202 Hygiene and labor protection in production was developed by the Kazakh National Research Technical University named after K.I. Satpayev and provides the opportunity to obtain in-depth knowledge, key skills and abilities of the graduate and his further development in the field of labor protection and industrial safety, protection in emergency situations. This EP is designed taking into account the possibility of providing the master's student with a choice of an appropriate educational trajectory or a specific specialization based on the main educational program, but containing their own individual competencies reflecting the specifics of a particular specialization in the field of 7M11202 Hygiene and labor protection in production.

2. Purpose and objectives of the educational program

Purpose of the EP: The purpose of the educational program 7M11202 Hygiene and labor protection in production is to train highly qualified masters of technical sciences with fundamental scientific knowledge in the field of hygiene and occupational safety in production, industrial safety, protection in emergency situations, capable of implementing the acquired knowledge in design and engineering, production and technological, research, organizational and managerial and scientific and pedagogical activities, taking into account the goals of sustainable development and inclusiveness of students (SDG 4).

Objectives of the OP:

- selection and calculation of the main parameters of means of protection of people and the environment in relation to specific conditions based on innovative methods and systems (SDG 12);
- calculation and design work on the creation of means of ensuring safety, rescue and protection of people from man-made and anthropogenic impacts based on broad participation and inclusiveness;
- development of sections of projects related to safety issues, taking into account the expansion of infrastructure and improvement of technologies to provide clean and more efficient energy (SDG 7);
- engineering, design and author's support of scientific research in the field of safety and technical implementation of innovative developments (SDG 12);
- optimization of production technologies in order to reduce the impact of negative factors on people and the environment (SDG 7);
- conducting an economic assessment of the developed protection systems or proposed technical solutions (SDG 8);
- examination of projects and the state of objects on labor safety and protection in emergency situations (SDG 7);
- selection of life safety systems, fire, chemical, biological and other safety of production (SDG 11); - formation of principles of labor protection culture in the

organization, development of a system for collecting, analyzing and exchanging information. Collection of information on human, technical, organizational and environmental factors that determine the safety of the system as a whole, taking into account inclusiveness.

3. Requirements for the assessment of learning outcomes of the educational program

Awarded degree/qualification: a graduate of this educational program is awarded the academic degree of "Master of Engineering and Technology" in the field of 7M11202 Hygiene and labor protection in production.

A graduate who has mastered the master's program must have the following general professional competencies:

- the ability to independently acquire, comprehend, structure and use new knowledge and skills in professional activities, develop their innovative abilities;
- the ability to independently formulate research goals, establish a sequence for solving professional problems;
- the 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;
- the ability to critically analyze, present, defend, discuss and disseminate the results of their professional activities;
- skills in compiling and formatting scientific and technical documentation, scientific reports, reviews, papers and articles;
- readiness to manage a team in the field of their professional activity, tolerantly perceiving social, ethnic, religious and cultural differences;
- readiness for oral and written communication in a foreign language to solve problems of professional activity.

A graduate who has mastered the master's program must have professional competencies corresponding to the types of professional activity that the master's program is focused on.

Design and engineering activities:

- the ability to carry out complex engineering and technical developments in the field of safety;
- the ability to predict, identify areas of increased man-made risk and areas of increased pollution;
- the ability to optimize methods and ways of ensuring human safety from the impact of various negative factors in the technosphere;
- the ability to conduct an economic assessment of the effectiveness of the implemented engineering and technical measures.

Production and technological activities:

- the ability to independently carry out production and research and production work when solving practical problems;

- the ability to professionally operate modern equipment and devices in the field of the mastered master's program;

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

- the ability to independently draw up and present projects of research and production work;

- readiness to design complex research and production work when solving professional problems;

- the ability to independently conduct audits and inspections;

- the ability to assess production risks and draw up plans for corrective measures, have skills in HAZOP, HAZID methods;

- the ability to conduct incident investigations according to the "five whys" and "tree of causes" methods.

Research activities:

- the ability to solve professional problems by integrating fundamental and technical sciences and specialized knowledge in the field of hygiene and labor protection, industrial safety, protection in emergency situations, obtained while mastering the master's program;

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

- the ability to create and explore models of the objects under study based on the use of in-depth theoretical and practical knowledge in the field of life safety;

- the ability to analyze, optimize and apply modern information technologies in solving scientific problems;

Organizational and managerial activities:

- readiness to use practical skills in organizing and managing research and production work in solving professional problems on protecting the environment at the level of an enterprise, territorial production complexes and regions, as well as the activities of an enterprise in an emergency;

- readiness for the practical use of regulatory documents in planning and organizing research and production work on safety issues;

- the ability to interact with government services in the field of industrial, fire safety, protection in emergency situations;

- the ability to rationally resolve issues of safe placement and use of technical equipment in the regions;

- the ability to apply in practice theories of making management decisions and methods of expert assessments.

Scientific and pedagogical activity:

- Scientific and pedagogical activity:

- ability to conduct seminars, laboratory and practical classes;

- ability to participate in the development of interactive teaching methods, educational and methodological documentation, multimedia materials and methods of monitoring training;

- ability to participate in the management of scientific and educational work

of students in the field of life safety.

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

4. Passport of the educational program

4.1. General information

№	Field name	Note
1	Code and classification of the field of education	7M11 Services
2	The code and classification of training areas	7M112 Hygiene and labor protection in production
3	Group of educational programs	M150 - Sanitary and preventive measures
4	Name of the educational program	7M11202 Hygiene and labor protection in production
5	Brief description of the EP	The 7M11202 educational program provides an opportunity to gain in-depth scientific knowledge, research skills and skills and its further development in the field of occupational safety and industrial safety, protection in emergency situations.
6	The purpose of the educational program	The goal of the educational program 7M11202 - Hygiene and labor protection in productionis to train highly qualified masters of technical sciences with fundamental scientific knowledge in the field of occupational health and safety in production, industrial safety, protection in emergency situations, capable of implementing the acquired knowledge in design and engineering, production and technological, research, organizational and managerial and scientific and pedagogical activities, taking into account the goals of sustainable development and the inclusiveness of students (SDG 4).
7	Type of educational program	New EP
8	NQF level	7
9	Level by IQF	7
10	Distinctive features of the EP	No
11	List of educational program competencies:	- ability to perform complex engineering and technical developments in the field of life safety; -the ability to predict and identify areas of increased anthropogenic risk and areas of increased pollution of the working environment; - the ability to optimize methods and methods of ensuring human safety from the effects of various negative factors in the technosphere; - the ability to conduct an economic assessment of the effectiveness of implemented engineering and technical

		measures; - the ability to put into practice various human protection measures in working conditions and in emergency situations; the ability to carry out technical and economic calculations of measures to improve safety; - the ability to implement new methods to increase the reliability and stability of technical facilities, maintaining their functional purpose; - basic skills in conducting an assessment of industrial risks and developing corrective measures, investigating accidents and preventing their recurrence, conducting safety audits and inspections.
12	Learning outcomes of the educational program:	LO1-Be able to use philosophical concepts of natural science to form a scientific worldview and scientific and methodological foundations in the field of occupational health and safety; be able to conduct theoretical and practical classes; use pedagogical methods and means to improve the effectiveness and quality of education (SDG 4); LO2-Be able to determine the probabilities (frequencies) of dangerous situations using hazard analysis and risk assessment methods in the occupational health and safety management system, increase the reliability and stability of production facilities, and maintain their functional purpose using system analysis (SDG 11); LO3-Be able to design and calculate safety systems and devices, means of improving the safety of facilities; evaluate the effectiveness of their work based on an analysis of occupational health and safety conditions; identify the main hazards to the environment through legislative and legal acts and conceptual and terminological apparatus in the field of occupational health and safety in various industrial processes in emergency situations (SDG 11); LO4-Be able to comply with the requirements and restrictions in personal, work and social life, including inclusivity, develop their own skills and socialize students as successfully as they choose and implement life plans (SDG 4); LO5-Be able to diagnose occupational health and safety problems, identify areas of increased technogenic risk and areas of increased pollution of the working environment, develop training programs based on an educational standard, taking into account industry specifications on occupational health and safety, safety and sustainable development by assessment and modeling methods, forecasting the development of various processes occurring in natural and man-made systems (SDGs 11, 12); LO6-Be able to solve occupational safety and health issues based on the study of the OHSAS 18001 occupational safety and health management system and certified state courses in occupational health and safety, with the condition of inclusivity; LO7-Be able to make decisions to protect personnel and the public from the possible consequences of accidents,

		catastrophes, and natural disasters; simulate hazardous processes in the field of occupational health and safety and ensure the safety of the systems being created (SDGs 9, 12); LO8-Be able to develop skills in developing methodological and regulatory materials, technical documentation on occupational health and safety, and organization of compliance with established national and international requirements, applicable norms, rules, and standards; LO9-Be able to develop and implement new techniques and technologies to ensure occupational health and safety using international standards and standards of the Republic of Kazakhstan and participate in the improvement of quality management systems, occupational health and safety management in the organization to minimize the impact of hazards and hazards on humans (SDG 9); LO10-Be able to perform engineering, scientific and methodological work, organizational work, in order to improve knowledge and skills under various working conditions, monitor industrial safety, technological processes and equipment from the perspective of safety and inclusiveness (SDGs 4, 9); LO11-Be able to carry out scientific and methodological work including engineering and economic calculations of measures to ensure occupational health and safety at work, read project documentation and competently draw up a task for designing activities, including those using secondary renewable energy; conduct pre-qualification (certification) of trainees to assess the level of training, including inclusivity, and draw up documentation on based on the results of training and retraining, and interact with stakeholders in higher and postgraduate education (SDGs 4, 7).
13	The form of education	full-time
14	Duration of training	1,5
15	Volume of loans	90
16	Languages of instruction	Russian, Kazakh, English
17	Academic degree awarded	Master of engineering and technology
18	Developer(s) and authors:	Nuruldayeva G.Zh., Shevtsova V.S.

4.2. Relationship between the achievability of the formed learning outcomes based on educational program and academic disciplines

№	Discipline name	Short description of discipline	Amount of credits	Generated learning outcomes (codes)										
				PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
Cycle of general education disciplines University component														
1	English (professional)	The course is designed for undergraduates of technical specialties to improve and develop foreign language communication skills in professional and academic fields. The course introduces students to the general principles of professional and academic intercultural oral and written communication using modern pedagogical technologies (round table, debates, discussions, analysis of professionally oriented cases, design). The course ends with a final exam. Undergraduates also need to study independently (MIS).	5	v										v
2	Management	Objective: to develop a scientific understanding of management as a type of professional activity. Content: mastering by master's students of general theoretical principles of managing socio-economic systems; acquiring skills and abilities in practical solutions to management problems; studying global management experience, as well as the specifics of Kazakhstani management; training in solving practical issues related to managing various aspects of organizations' activities.	2	v			v							
3	Psychology of management	The course is aimed at teaching undergraduates the basics of management psychology. It will consider the specifics of management psychology, psychological	2	v			v							

		patterns of management activities, personality and its potential in the management system; motivation and performance in the organization, leadership and leadership in modern management of organizations, a social group as an object of management, the psychological basis for making managerial decisions, business communication and managerial conflicts, the psychology of responsibility, creating an image as an integral part of the culture of communication, the psychology of advertising.												
Cycle of basic disciplines Optional component														
4	Risk Management and Systems Analysis	The course examines the theoretical foundations of risk management and systems analysis in the technosphere. The methodology of program-targeted forecasting and risk regulation associated with the functioning of human-machine systems, methods of risk analysis and assessment, assessment of the probability of occurrence and the amount of damage, calculation of the degree of risk, the basic principles of systems analysis of the process of causing damage are studied. The "black box" model. Structuring of systems. Structural analysis of the FTA (fault tree analysis) system, purpose and scope of application, advantages and limitations of application, the principle of construction and use.	4				v					v		
5	Assessment of reliability, survivability and safety of technical systems	Objective: to develop students' competencies for analyzing and improving the operational characteristics of systems under potential risks and loads. Content:	4				v					v		

		study of the main theoretical foundations of reliability, survivability and safety of technical systems; mastering methods and approaches for failure analysis, identifying weaknesses and increasing the stability of systems; development of skills in modeling and forecasting reliability indicators (SDG 8).												
6	Professional programs in the Life Safety	System Knowledge of professional computer programs for their qualified application in practice, provision of modern management of production processes that prevent industrial injuries, occupational diseases, accidents, and fires.	5	v				v						
7	Information technologies in the field of security	As a result of studying the discipline, the master's student receives knowledge related to modern computer and information technologies used in the field of ensuring security in the technosphere; the ability to effectively select optimal computer and information technologies and optimize security measures; learns to possess the skills of implementing computer and information technologies in solving practical problems in the field of technosphere security; methods for calculating the socio-economic efficiency of protective measures; development of business plans and programs for ensuring security.	5			v							v		
Cycle of major disciplines University component														
8	Conducting a special assessment of the safety and comfort of working conditions	Formation of knowledge in the field of conducting a special assessment of the safety and comfort of working conditions in accordance with the standards of hygienic assessment of existing conditions and the	5							v	v			

		nature of work, assessment of workplace safety, assessment of the provision of workers with personal protective equipment; the ability to use regulatory documents that determine the procedure for conducting work on a special assessment of the safety of industrial facilities.												
9	Scientific and methodological foundations of industrial safety	Basic principles, goals and objectives of scientific and technical policy and research activities in the study of industrial safety. Scientific analysis of human safety problems and methods for solving them at the individual, professional, national and global levels in fundamentally new post-industrial conditions (SDG 9).	5			v						v		
Cycle of major disciplines Elective component														
10	Security issues in projects	Formation of generalizing theoretical knowledge and practical experience in organizational safety management in projects. The use of a single concept, methods, techniques and tools as the most important security mechanisms in projects aimed at coordinating the efforts of all project participants.	5							v	v			
11	Modeling in the technosphere safety forecasting system	Studying the methodology of system thinking and comprehensive consideration of complex problems, acquiring knowledge and skills in multi-aspect modeling, acquiring knowledge in the field of modeling real processes and phenomena that underlie the safety of technical systems, acquiring the skills to use the acquired knowledge in practical work.	5		v					v				
12	Expertise of technosphere and environmental safety	The discipline contributes to the formation of legal and regulatory principles of technosphere and environmental expertise,	5			v	v							

		reveals modern problems of ecology and nature management; classification of risks; basic approaches to risk management in modern economic conditions; ecological state of the environment; quantitative risk assessment; methods of analysis and assessment of technological schemes of enterprises for the formation of a waste-free scheme (SDG 7)												
13	Sustainable functioning of economic facilities in emergency situations	Acquisition of practical skills necessary for systematization of scientific research to solve organizational and managerial tasks to ensure industrial safety, increase the sustainability of industry facilities and life support of the population in emergency situations, taking into account modern requirements; identification of hazards, their sources, levels and causes of occurrence, characteristic of the most energy-intensive industries and processes; development of the main directions of preventive measures to increase the sustainability of potentially hazardous industries in emergency situations.	5							v		v		
14	Modern research in the field of BJD	The study of modern patterns of emergence and development of threats and dangers and ways to effectively protect society (a person, his communities, humanity) and his environment from them in any conditions of life (SDG 16).	5				v		v					
15	Technique and technology of protection in the technosphere	Formation of knowledge about the general methods for designing systems for protecting the environment from radiation, electromagnetic, noise, chemical pollution, air exchange and lighting systems, identifying potential hazards in production, performing risk assessments and developing	5				v			v				

		appropriate corrective measures in the field of using protective equipment and technologies (SDG 7).												
16	Conducting research and assessing the technogenic impact of industrial enterprises on the environment	Formation of knowledge necessary to reduce the negative impact of the technosphere on the natural environment through the rational and integrated use of raw materials and energy resources or in the creation of new eco-protective devices and technologies, environmentally friendly production processes, in the combination and cooperation of industries, as well as in the development of an environmental strategy and policy for the development of production (SDG 7).	5		v					v				
17	Organization and conduct of work on liquidation and assessment of the consequences of emergencies	The purpose of the study: to prepare undergraduates to solve organizational and managerial tasks to ensure industrial safety, increase the sustainability of industry facilities and life support of the population in emergency situations, for which it is necessary to study the sustainability of economic objects and the principles of the formation of technosphere regions; dangerous technologies and productions; study of the stability of the functioning of the object of the economy and assessment of the possible situation in the organization in case of natural disasters, accidents, catastrophes; organization of protection of production personnel and material and technical means at chemical, radiation, explosion and fire hazardous enterprises and ways to minimize the risk of emergencies.	5				v			v				
18	Calculation and design of safety systems	The purpose of the discipline is to develop knowledge about the general principles and methods of calculation and design of	5			v				v				

		protection systems against hazardous and harmful production factors and to develop recommendations based on them; to develop the ability to prepare data necessary for calculating means of protection against hazardous and harmful production factors; to develop skills in calculating and designing means of protection against hazardous and harmful production factors; to develop recommendations for protection systems against hazardous and harmful production factors.												
19	Safety Monitoring	The objective of the discipline is to develop a set of knowledge on issues of organizing safety monitoring aimed at reducing natural and man-made risk factors for the population, natural objects, industrial and residential areas. Objectives of the discipline: • development of knowledge on organizing monitoring, assessment and forecasting of natural and man-made risk factors; development of skills in identifying pollution of environmental objects and man-made risk zones; development of skills in selecting measurement tools and methods to assess the level of pollution of objects (SDG 12).	5			**v**				**v**				
20	Ensuring Fire and Explosion Safety of Technological Processes and Production	The discipline is aimed at training specialists capable of applying the results of fire hazard analysis of technological processes and equipment to supervise fire and explosion safety of production technologies. Objectives of the discipline: formation of knowledge in the field of organizing fire and explosion safety management at an enterprise; mastering methods for assessing the compliance of	4			**v**				**v**				

		technological equipment of fire and explosion hazardous production with fire safety requirements; formation of skills in preventing emergency situations associated with fires and explosions, as well as the implementation of fire protection and explosion protection methods at an enterprise.												
21	Expertise and audit of industrial facilities safety	The course is aimed at training specialists who are able to assess and analyze the safety level of industrial facilities. The main objective of the course is to develop skills in conducting expertise and audits that meet modern standards and regulatory requirements. Objectives of the course: study of risk assessment methods and safety assurance at industrial enterprises; familiarization with the regulatory framework in the field of industrial safety; development of skills in conducting an independent safety audit; development of an analytical approach to identifying potential threats and weaknesses in security systems (SDG 9).	4				**v**			**v**				
22	Certified State Course on Occupational Safety and Health	Training of certified specialists who have the right to work as a manager or a person responsible for ensuring occupational safety and health in organizations of any form of ownership in the Republic of Kazakhstan (SDG 9).	5					**v**					**v**	
23	Integrated safety management systems	Theoretical and practical foundations of integrated occupational health and safety management systems to eliminate or minimize risks to workers and other interested parties whose health may be exposed to hazards associated with the activities they carry out.	5					**v**		**v**				

5. Curriculum of educational program

NON-PROFIT JOINT STOCK COMPANY
"KAZAKH NATIONAL RESEARCH TECHNICAL UNIVERSITY NAMED AFTER K.I. SATBAYEV"

SATBAYEV UNIVERSITY

«APPROVED»
Decision of the Academic Council
NPJSC«KazNRTU
named after K.Satbayev»
dated 21.04.2025 Minutes № 13

WORKING CURRICULUM

Academic year	**2025-2026 (Autumn, Spring)**
Group of educational programs	**M150 - "Sanitary measure"**
Educational program	**7M11202 - "Hygiene and labor protection in production"**
The awarded academic degree	**Master of Services**
Form and duration of study	**full time (professional track) - 1,5 years**

Discipline code	Name of disciplines	Block	Cycle	credits Total ECTS	Total hours	Contact hours lek/lab/pr	SIS (including TSIS) in hours	Form of control	Allocation of face-to-face training based on courses and semesters			Prerequisites
									1 course		2 course	
									1 sem	2 sem	3 sem	
CYCLE OF GENERAL EDUCATION DISCIPLINES (GED)												
CYCLE OF BASIC DISCIPLINES (BD)												
M-1.Module of basic training (university component)												
LNG212	Foreign language (professional)		BD, UC	2	60	0/0/30	30	E	2			
MNG726	Management		BD, UC	2	60	15/0/15	30	E	2			

HUM211	Psychology of management		BD, UC	2	60	15/0/15	30	E	2			
SAF238	Risk management and system analysis	1	BD, CCH	4	120	30/0/15	75	E	4			
SAF239	Evaluation of Reliability, Survivability, and Safety of Technical Systems	1	BD, CCH	4	120	30/0/15	75	E	4			
SAF220	Professional programs in life safety	2	BD, CCH	5	150	15/0/30	105	E	5			
SAF240	Information technology in the field of security	2	BD, CCH	5	150	15/0/30	105	E	5			
CYCLE OF PROFILE DISCIPLINES (PD)												
M-2. Module of professional activity (university component, component of choice)												
SAF215	Conducting a special assessment of the safety and comfort of working conditions		PD, UC	5	150	15/0/30	105	E	5			
SAF206	Scientific and methodological foundations of industrial safety		PD, UC	5	150	15/0/30	105	E	5			
SAF237	Expertise of technospheric and environmental safety	1	PD, CCH	5	150	15/0/30	105	E	5			
SAF235	Sustainable operation of economic entities in the emergency situation	1	PD, CCH	5	150	15/0/30	105	E	5			
SAF223	Safety issues in projects	1	PD, CCH	5	150	15/0/30	105	E		5		
SAF229	Modeling in forecasting system technosphere safety	1	PD, CCH	5	150	15/0/30	105	E		5		
SAF209	Modern research in the field of life safety	2	PD, CCH	5	150	15/0/30	105	E		5		
SAF218	Technique and technology of protection in the technosphere	2	PD, CCH	5	150	15/0/30	105	E		5		
SAF213	Conducting research and assessment of the technogenic impact of industrial enterprises on the environment	3	PD, CCH	5	150	15/0/30	105	E		5		
SAF211	Organization and performance of liquidation and assessment of emergencies consequences.	3	PD, CCH	5	150	15/0/30	105	E		5		
SAF241	Calculation and design of safety systems	4	PD, CCH	5	150	15/0/30	105	E		5		
SAF242	Safety monitoring	4	PD, CCH	5	150	15/0/30	105	E		5		
SAF216	Certified state course on occupational health and safety	5	PD, CCH	5	150	15/0/30	105	E		5		
SAF225	Integrated safety management systems	5	PD, CCH	5	150	15/0/30	105	E		5		

SAF223	Safety issues in projects	1	PD, CCH	5	150	15/0/30	105	E		5		
SAF229	Modeling in forecasting system technosphere safety	1	PD, CCH	5	150	15/0/30	105	E		5		
SAF209	Modern research in the field of life safety	2	PD, CCH	5	150	15/0/30	105	E		5		
SAF218	Technique and technology of protection in the technosphere	2	PD, CCH	5	150	15/0/30	105	E		5		
SAF213	Conducting research and assessment of the technogenic impact of industrial enterprises on the environment	3	PD, CCH	5	150	15/0/30	105	E		5		
SAF211	Organization and performance of liquidation and assessment of emergencies consequences.	3	PD, CCH	5	150	15/0/30	105	E		5		
SAF241	Calculation and design of safety systems	4	PD, CCH	5	150	15/0/30	105	E		5		
SAF242	Safety monitoring	4	PD, CCH	5	150	15/0/30	105	E		5		
SAF216	Certified state course on occupational health and safety	5	PD, CCH	5	150	15/0/30	105	E		5		
SAF225	Integrated safety management systems	5	PD, CCH	5	150	15/0/30	105	E		5		
SAF243	Ensuring fire and explosion safety of technological processes and productions	1	PD, CCH	4	120	30/0/15	75	E			4	
SAF244	Expertise and audit of industrial facility safety	1	PD, CCH	4	120	30/0/15	75	E			4	
M-3. Practice-oriented module												
AAP284	Internship		PD, UC	5				R		5		
M-4. Experimental and research module												
AAP249	Experimental research work of a master student, including an internship and the implementation of a master's project		ERWMS	18				R			18	
M-5. Module of final attestation												
ECA213	Design and defense of the master's project		FA	8							8	
Total based on UNIVERSITY:									30	30	30	
									60		**30**	

Number of credits for the entire period of study

Cycle code	Cycles of disciplines	Credits			
		Required component (RC)	University component (UC)	Component of choice (CCH)	Total
GED	Cycle of general education disciplines	0	0	0	0
BD	Cycle of basic disciplines	0	6	9	15
PD	Cycle of profile disciplines	0	15	34	49
Total for theoretical training:		**0**	**21**	**43**	**64**
RWMS	Research Work of Master's Student				0
ERWMS	Experimental Research Work of Master's Student				18
FA	Final attestation				8
TOTAL:					**90**

Decision of the Educational and Methodological Council of KazNRTU named after K.Satpayev. Minutes № 6 dated 18.04.2025

Decision of the Academic Council of the Institute. Minutes № 5 dated 13.12.2024