NCJS «KAZAKH NATIONAL RESEARCH TECHNICAL UNIVERSITY
named after K.I.SATBAYEV»

Institute of Geology, Oil and Mining named after K. Turysov

Department of «Petroleum Engineering»

EDUCATIONAL PROGRAM

7M07146 «Gas Engineering»

Code and classification of field of education: 7M07 «Engineering, Manufacturing and Construction industries»
Code and classification of direction of personnel training : «7M071 Engineering and engineering affairs»
Group of educational programs: M210 «Transmission system and infrastructure»
Level on NQF: 7
Level on SQF: 7
Period of study: 2
Volume of the credits: 120

Almaty 2025

Educational program 7M07146 «Gas Engineering» approved at the meeting of the Academic Council of KazNRTU named after K.Satbayev.

Protocol no. 10 from 2025 y. "03" 06.

Reviewed and recommended for approval at a meeting of the Educational and Methodological Council of KazNRTU named after K.Satbayev.

Protocol no. 3 from 2024 y. "20" 12.

Educational program 7M07146 «Gas Engineering» eveloped by the academic committee in the direction of 7M071 «Engineering and engineering trades»

Full name	**Academic degree/ academic title**	**Position, course**	**Place of work, contact.**	**Note**
Chairperson of Academic Committee:				
Dias Abdimaulen	PhD	Head of the Department	NCJS «Kazakh National Research Technical University named after K.I.Satbayev»	
Teaching staff:				
Gulnaz Moldabayeva	Doctor of Technical Sciences, prof.	Professor	NCJS «Kazakh National Research Technical University named after K.I.Satbayev»	
Zaurbekov Seitzhan	Candidate of Technical Sciences	Professor	NCJS «Kazakh National Research Technical University named after K.I.Satbayev»	
Akhymbayeva Bibinur	PhD	Associate Professor	NCJS «Kazakh National Research Technical University named after K.I.Satbayev»	
Baimukhametov Murat	Candidate of Physical and Mathematical Sciences, docent	Associate Professor	NCJS «Kazakh National Research Technical University named after K.I.Satbayev»	
Moldabekov Murat	PhD	Associate Professor	NCJS «Kazakh National Research Technical University	

			named after K.I.Satbayev»	
Smashov Nurlan	Candidate of Technical Sciences, docent	Associate Professor	NCJS «Kazakh National Research Technical University named after K.I.Satbayev»	
Imansakipova Nurgul	PhD	Associate Professor	NCJS «Kazakh National Research Technical University named after K.I.Satbayev»	
Yskak Ardak	PhD	Senior Lecturer	NCJS «Kazakh National Research Technical University named after K.I.Satbayev»	
Employers:				
Nurkas Zhasulan		Director	LLP «Manul»	
Bekbau Bakbergen	PhD	Leading Researcher, Modeling Service	«KMG Engineering» LLP	
Nysangaliyev Amangali	Doctor of Technical Sciences, Professor, Academician of the National Engineering Academy of the Republic of Kazakhstan	Director of the Center for Ground Design	JSC «Kazakh Institute of Oil and Gas»	
Students:				
Ibrayeva Korlan	Doctoral student in the educational program 8D07202 – "Petroleum Engineering"	2nd year	NCJS «Kazakh National Research Technical University named after K.I.Satbayev»	

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1. Description of the educational program

The educational program 7M07146 "Gas Engineering" is aimed at training masters who are able to independently solve a wide range of engineering problems in the field of the gas industry and conduct scientific and pedagogical activities.

The educational program is designed to train specialists in the field of development and operation of gas fields, well drilling, transportation and storage of hydrocarbons.

The curriculum of the 7M07146 "Gas Engineering" educational program has been developed taking into account the curricula of the master's degree program of famous research and engineering universities of the world, such as Colorado Schools of Mines, University of Lorraine. The curriculum is fully consistent with current trends in the development of science and technology used in the modern gas industry. The educational program is based on the state educational standard for higher professional education; the professional standard. Atlas of New Professions is a universal pipeline section manager. The professional standard for this educational program is:

1) Operational dispatch management;

2) Teacher (faculty) of organizations of higher and (or) postgraduate education;

3) Production technology

To get acquainted with innovative technologies and new types of production, it is provided for mandatory scientific internship in such companies as JSC NC "QazaqGaz", JSC "Kazmunaygas", LLP "KMG Engineering", JSC "Kazakh Institute of Oil and Gas". Under the academic mobility program, undergraduates have the opportunity to complete internships at leading engineering universities in the world.

At all levels of training, teaching is conducted by highly qualified teaching staff, including graduates of universities around the world and the Bolashak program.

Graduates can choose a different career path. They can start working directly as practicing engineers in industry, or they can continue their doctoral studies in petroleum engineering.

The Master's degree program "Petroleum Engineering" is the second level of qualification of the three-level higher education system, it lays the foundation for doctoral programs. The educational program 7M07146 "Gas Engineering" was reviewed at a meeting of the Educational and Methodological Council of KazNRTU named after K.I. Satpayev and approved at a meeting of the Academic Council of KazNRTU named after K.I. Satpayev.

2. Purpose and objectives of the educational program

EP purpose: The aim of the Gas Engineering program is to form highly qualified specialists for the gas industry with a high level of competence, comprehensively developed, with broad technical knowledge and skills in the field

of engineering and technology for the design and operation of oil and gas storage facilities and pipelines. The program focuses on the introduction of innovative and sustainable technologies that take into account the environmental, social and economic aspects of the industry, in accordance with the International Sustainable Development Goals (SDGs).

EP objectives:

- the formation of general cultural competencies of graduates (competencies of social interaction, self-organization and self-government, of a systemic activity nature), the implementation of a competent approach in the formation of general cultural competencies of graduates should be ensured by a combination of educational and extracurricular work; the socio-cultural environment necessary for the all-round development of the individual;

- formation of general professional and professional competencies of graduates.

3. Requirements for assessing learning outcomes of an educational program

The educational program has been developed in accordance with the State Mandatory Standards of Higher and Postgraduate Education, approved by Order No. 2 of the Minister of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022 (registered in the Register of State Registration of Regulatory Legal Acts under No. 28916) and reflects the learning outcomes on the basis of which curricula are developed (working curricula, individual students' curricula) and work study programs in disciplines (syllabuses).

Assessment of learning outcomes is carried out according to the developed test tasks within the framework of the educational program in accordance with the requirements of the state mandatory standard of higher and postgraduate education.

When assessing learning outcomes, uniform conditions and equal opportunities are created for students to demonstrate their knowledge, skills and abilities.

4. Passport of the educational program

4.1. General information

№	Field name	Note
1	Code and classification of field of education:	7M07 «Engineering, Manufacturing and Construction industries»
2	Code and classification of direction of personnel training :	«7M071 Engineering and engineering affairs»
3	Group of educational programs:	M210 «Transmission system and infrastructure»

4	Name of educational program	7M07146 «Gas Engineering»
5	Brief description of the educational program	The main professional educational program (EP) of the magistracy, implemented by the Kazakh National Research Technical University named after K.I. Satpayev and approved by the Ministry of Education and Science of the Republic of Kazakhstan in the field of training "Gas Engineering" is a system of documents developed and approved taking into account the requirements of the labor market on the basis of the state educational standard of higher education. EP regulates the goals, expected results, content, conditions and technologies for the implementation of the educational process, assessment of the quality of the graduate's training in this area of training and includes the curriculum, work programs of modules / disciplines, internship programs, state final certification and other materials to ensure quality education. The development and management of the educational program of postgraduate education "Gas Engineering" is carried out in accordance with the standard and working curriculum, developed by the Kazakh National Research Technical University named after. KI Satpaev and approved in the prescribed manner.
6	EP purpose	The aim of the Gas Engineering program is to form highly qualified specialists for the gas industry with a high level of competence, comprehensively developed, with broad technical knowledge and skills in the field of engineering and technology for the design and operation of oil and gas storage facilities and pipelines. The program focuses on the introduction of innovative and sustainable technologies that take into account the environmental, social and economic aspects of the industry, in accordance with the International Sustainable Development Goals (SDGs).
7	EP type	New EP
8	Level on NQF	7
9	Level on SQF	7
10	Distinctive features of the EP	no
11	List of competencies of the educational program:	1.Apply knowledge of oil and gas engineering and skills of critical analysis, evaluation and synthesis of new ideas in professional activities; 2. Apply qualitative and quantitative methods of analysis, collection, integration and interpretation of data in accordance with the standards of the oil and gas industry; 3. Have a steady desire to constantly improve their professional knowledge and self-development; 4. Conduct independent research based on their own skills and abilities to obtain scientific results that contribute to the development of the oil and gas industry;

		5. Have a developed ability to conduct professional written and oral communication with all stakeholders in the oil and gas industry; 6. Have the ability to demonstrate high professional qualities, ethics, and environmental culture while performing production and/or scientific tasks in the oil and gas industry; 7.To evaluate the commercial principles of business activities, satisfaction of production and public needs in the activities of the oil and gas industry
12	Educational program learning outcomes:	1. To apply knowledge of gas engineering and skills of critical analysis, evaluation and synthesis of new ideas in professional activities; 2. To apply qualitative and quantitative analysis methods to solve technological problems, collect, integrate and interpret data according to gas industry standards; 3. To design technological processes of gas pumping and storage in tanks, including with the use of modern computer technology; 4. To conduct independent research based on their own skills and abilities to obtain scientific results that contribute to the development of the gas industry and hydrocarbon gas processing products; 5. To demonstrate a developed ability to conduct professional written and oral communication with all stakeholders in the gas industry and transfer knowledge; 6. To Identify, formulate and solve technical problems during the operation of gas storage facilities, as well as pipelines during the transportation of gas and hydrocarbon processing products; 7. To have the ability to demonstrate high professional qualities and ethics during the performance of production and/or scientific tasks of the oil and gas industry
13	Form of training	Full time
14	Period of study	2
15	Volume of the credits	120
16	Language of education	Kazakh, Russian, English
17	Academic degree awarded:	Master of Technical Sciences
18	Developer and author:	PhD, Associate Professor Imansakipova Nurgul

4.2. The relationship between the achievability of the formed learning outcomes in the educational program and academic disciplines

№	Name of discipline	Short description of discipline	Amount of credits	The formed educational outcomes						
				PO1	PO2	PO3	PO4	PO5	PO6	PO7
Cycle of basic disciplines University component										
1	Foreign language (professional)	The course is aimed at studying the main problems of scientific knowledge in the context of its historical development and philosophical understanding, the evolution of scientific theories, principles and methods of scientific research in the historical construction of scientific paintings of the world. The discipline will help to master the skills of developing critical and constructive scientific thinking based on research on the history and philosophy of science. At the end of the course, undergraduates will learn to analyze the ideological and methodological problems of science and engineering and technical activities in building Kazakhstan's science and the prospects for its development.	3					v		v
2	History and philosophy of science	Purpose: To explore the history and philosophy of science as a system of concepts of global and Kazakh science. Contents: The subject of philosophy of science, dynamics of science, the main stages of the historical development of science, features of classical science, non-classical and post-non-classical science, philosophy of mathematics, physics, engineering and technology, specifics of	3				v	v		

		engineering sciences, ethics of science, social and moral responsibility of a scientist and engineer.								
3	Higher school pedagogy	The course is aimed at mastering the methodological and theoretical foundations of higher education pedagogy. The discipline will help to master the skills of modern pedagogical technologies, technologies of pedagogical design, organization and control in higher education, skills of communicative competence. At the end of the course, undergraduates learn how to organize and conduct various forms of organizing training, apply active teaching methods, and select the content of training sessions. Organize the educational process on the basis of credit technology of education.	3					**v**		**v**
4	Psychology of management	The course is aimed at mastering the tools for effective employee management, based on knowledge of the psychological mechanisms of the manager's activity. Discipline will help you master the skills of making decisions, creating a favorable psychological climate, motivating employees, setting goals, building a team and communicating with employees. At the end of the course, undergraduates will learn how to resolve managerial conflicts,	3					**v**		**v**

		create their own image, analyze situations in the field of managerial activity, as well as negotiate, be stress-resistant and effective leaders.								
5	Pedagogical practice	Application in the educational process of modern scientific knowledge of the discipline, the use of innovative technologies in the organization of the educational process. Creating the conditions to achieve professional competence in accordance with the requirements of the standard in the direction of training. Preparation for teaching activities in the mining, metallurgical and oil and gas production. Creation of scientific and pedagogical educational programs related to modern tasks of mining, metallurgical and oil and gas production, for use in scientific and scientific and technical universities and educational institute	6					v		v
Cycle of basic disciplines Election Component										
1	Automation of design of pipeline transport systems	Purpose: preparation of master's students for production-technological and project activities in the field of gas production, transportation and storage, as well as for organizational and managerial activities in interdisciplinary areas of oil and gas technologies using the principles of	5		v	v				

		management and management. Contents: training in methods of situation assessment and decision-making in organizational and technical systems, possession of skills of independent research activity, acquisition of knowledge and skills to ensure failure-free operation of automation systems, as well as the study of problems of automated design of technological processes, principles of design automation and a set of design automation tools.								
2	Innovative technologies for the construction and repair of gas storage facilities	Purpose: is to form master's students with in-depth knowledge and practical skills necessary for mastering advanced methods and technologies in construction, repair and modernization of gas storages. The main emphasis is placed on studying innovative approaches to design, construction and maintenance of gas storage facilities, as well as on mastering modern equipment and diagnostic methods. This allows future specialists to effectively solve problems related to ensuring safety, reliability and economic efficiency of gas storage facilities in conditions of rapid technological development and environmental sustainability requirements. Contents: study of advanced methods and technologies in the design, construction, repair and modernization of gas storage tanks. The content includes the analysis of modern approaches to the construction of gas reservoirs, the study of innovative equipment and tools for repair and	5		**v**	**v**				

		maintenance, as well as mastering the methods of diagnostics and control over the condition of gas reservoirs. Master students will also gain knowledge of modern requirements for safety and efficiency of gas storage, as well as technologies aimed at improving the environmental sustainability of gas storage facilities.								
3	Intellectual property and research	The purpose of this course is to provide undergraduates with the knowledge and skills necessary to understand, protect and manage intellectual property (IP) in the context of scientific research and innovation. The course is aimed at training specialists who can effectively work with IP, protect the results of scientific research and apply them in practice.	5	v					v	
4	Design of systems for the development of hydrocarbon deposits	Purpose: professional training of undergraduates for work in scientific and design organizations related to the development of oil and gas fields, including the formation of calculation and design skills and interaction with various specialists. Contents: formation of knowledge and skills in the field of design of hydrocarbon field development systems, as well as the application of these skills in practice when designing the development of hydrocarbon fields.	5			v				v
5	Strength and stability of inclined-horizontal multi-barrel wells	Purpose: comprehensive training of future specialists capable of effectively managing the processes of creation and operation of inclined-horizontal multilateral wells, ensuring their strength, stability and	5	v	v					

		economic feasibility. Contents: introduction to the problems of such wells, study of physical fundamentals and strength principles, stability analysis, design, operation, safety and environmental aspects, economic aspects, as well as innovations and development prospects. The course includes practical assignments and projects, providing students with a full range of knowledge and skills to effectively manage the creation and operation of deviated-horizontal multilateral wells.								
6	Sustainable development strategies	Purpose: To train graduate students in sustainable development strategies to achieve a balance between economic growth, social responsibility, and environmental protection. Content: Graduate students will study the concepts and principles of sustainable development, the development and implementation of sustainable development strategies, the evaluation of their effectiveness, and international standards and best practices. Cases and examples of successful sustainable development strategies are included.	5	**v**				**v**		
7	Technological modes of operation of gas transmission systems	Purpose: familiarization of master's students with technology and mode-technological processes of field and interfield gas gathering and treatment systems, gas transportation and pipeline distribution systems of high pressure, as well as the development of their skills to apply this knowledge for further mastering	5			**v**			**v**	

		of special disciplines. Contents: The discipline is aimed at familiarizing master's students with the technology and mode-technological processes of field and interfield gas gathering and treatment systems, gas transportation and pipeline distribution systems of high pressure. It also develops skills to apply the acquired knowledge for further mastering of special disciplines. The content includes the study of scientific fundamentals, terms and concepts used in the operation of gas transmission systems, methods of localization and elimination of abnormal situations, as well as the development of measures to improve the reliability, safety and efficiency of gas supply systems operation.								
8	Control of corrosion processes in the gas transmission system	Purpose: to provide master's students with in-depth knowledge and practical skills for effective control and management of corrosion processes in gas transportation systems. The emphasis is on developing the practical skills required to ensure the safety, reliability and durability of gas transmission infrastructure, as well as the importance of complying with standards and regulations for corrosion control in the gas industry. Contents: study of the basic principles of corrosion, mechanisms of its development and consequences for elements of gas transportation systems. Within the framework of the course, master students study methods of corrosion diagnostics and monitoring, as well as	5			**v**			**v**	

		various strategies and technologies for protecting metal structures from corrosion damage. Special attention is paid to the use of modern tools and equipment for corrosion prevention and control, including cathodic protection, coatings and corrosion inhibitors. In addition, master students study legislative and regulatory aspects as well as best practices in the field of corrosion management in the gas industry in order to ensure safety, reliability and efficiency of gas transportation systems.							
Cycle of profileded disciplines University component									
1	Information technologies in the gas transmission system	Purpose: training in information technologies for the analysis, forecasting and optimization of gas transportation processes using mathematical modeling and optimization methods. Content: The discipline covers: Mathematical modeling of gas transportation processes. Methods for optimizing gas transportation processes. Analysis and forecasting of the operation of the gas transmission system: Security of information systems	5		**v**	**v**			

2	Computer technologies for solving problems of pipeline transport	Purpose: mastering software tools: AutoCAD, MATLAB, Simulink, ANSYS, and others. Practical application of software tools in laboratory work for modeling pipeline systems and analyzing their characteristics. Content: The disciplines cover the joint use of AutoCAD, MATLAB, Simulink and ANSYS for complex analysis of pipeline systems in: 1. Pipeline design: - project development; - performance assessment; 2. operation of pipelines: - monitoring and management of pipeline systems; - diagnostics and forecasting of malfunctions; - modeling and analysis of emergency situations	5		v	v				
3	Monitoring of pipeline transport equipment	Purpose: to use monitoring data to assess the condition of pipeline equipment, predict possible damages and accidents, develop and implement measures to prevent them. Content: Methods for monitoring the condition of equipment. Forecasting of possible damages and accidents. Analysis of monitoring data. Assessment of the condition of pipeline equipment. Development and implementation of measures to prevent accidents. Ensuring the safety and reliability of pipelines.	5			v	v			

4	Reliability and safety of main pipelines	Purpose: to apply methods for assessing the reliability of main pipelines to determine the probability of accidents and assess their consequences. Content: the discipline covers statistical methods of reliability assessment, mathematical modeling of pipeline reliability. Assessment of the probabilities and consequences of accidents, analysis, restoration and repair of damaged pipelines	5	v					v	
5	Calculation of strength, stability and displacement of underground pipelines	Purpose: application of various calculation methods for the analysis of loads, stresses and deformations in underground pipelines. Features of operation and maintenance of underground pipelines, identification and analysis of possible causes of damage and accidents. Content: the discipline covers analytical and numerical methods of calculations, as well as the basics of the finite element method. Analysis of the calculation results and their interpretation. Fault prediction. Practical application.	5		v	v				
6	Research practice	The research practice of the undergraduate is conducted in order to familiarize himself with the latest theoretical, methodological and technological achievements of domestic and foreign science, modern methods of scientific research, processing and interpretation of experimental data.	8					v		v
Cycle of profileded disciplines Election Component										
1	Methods and algorithms for solving applied problems of pipeline transportation	Purpose: training of specialists with the necessary competencies to solve complex	5		v				v	

	of oil and gas.	engineering problems and ensure efficient operation of pipeline systems in the oil and gas industry. Contents: the program studies numerical simulation of hydraulic transport, optimization of pipeline system parameters, development of algorithms for monitoring and control of oil and gas transportation processes. Special attention is paid to the application of modern software and computational methods to solve specific engineering problems, which allows students to develop practical skills and competencies necessary for successful work in the oil and gas industry.								
2	Perspective processes of hydrocarbon gas	The purpose: The purpose of the discipline is the study of hydrocarbon gases, their purification, processing and preparation for transport. Contents: Characteristics of primary hydrocarbon gases and final products of their processing. General schemes of preparation and processing of hydrocarbon gases. Preparation of gas for processing. Purification of gases from harmful impurities. Characteristics of harmful impurities. Purification of gases from mercaptans. Utilization of hydrogen sulfide. Deep drying of natural gas. Extraction of heavy hydrocarbons from gas. Extraction of helium from purified gas. Stabilization and processing of gas condensates.	5				**v**		**v**	

3	Dispatch Decision Support Systems in Gas Pipeline Transport Management	Goal: Mastering methods and tools for analyzing and forecasting technological processes of gas transportation. Mastering the skills of managing technological processes of gas transportation in real time. Content: Methods of statistical data analysis. Modeling of technological processes. Modern technologies in the management of pipeline gas transportation. Development and implementation of dispatch decision support systems.	5		v				v	
4	Modern concepts of risk assessment and management in the gas industry	Purpose: is to provide master's students with comprehensive knowledge and skills to effectively analyze, assess and manage risks associated with activities in the gas industry. The main focus is on developing strategies for risk prevention and minimization, safety and compliance, which enables master students to be prepared for real challenges and situations in the gas industry, as well as to make informed and effective management decisions. Contents: study of methods and strategies for analyzing, assessing and managing risks specific to activities in the gas industry. The course emphasizes the study of modern risk management concepts such as risk analysis methodologies, scenario modeling, and the development of risk monitoring and control systems. Additionally, regulatory and legislative aspects as well as international standards in the field of risk management in the gas industry are discussed.	5	v			v			

5	Technological reliability of pipeline systems	Objective: to study methods and technologies to improve the reliability and safety of pipeline systems. Content: Methods for improving the reliability of pipeline systems. Methods of reliability assessment and analysis. Methods of mathematical modeling. Ensuring the safety of pipeline systems. The basic principles of security. Risk assessment and emergency management.	5	**v**					**v**	
6	Management of gas transmission systems	Purpose: To study the basics of gas flow management, monitoring and control, telecommunications and communications, principles of design and development of gas transmission systems, planning and optimization of resource allocation, development of technologies and security systems, management and coordination of work on the design, operation and management of gas pipelines and storage facilities. Content: the disciplines cover: 1. Principles of designing gas transmission systems; 2. Planning and optimization of resource allocation; 3. Development of technologies and security systems; 4. Monitoring and control of gas transmission systems; 5. Telecommunications and communication systems; 6. Management and coordination of work	5	**v**					**v**	
7	Chemistry and technology of organic substances (based on gas raw materials)	The purpose: The study of the main types of raw materials in the gas chemical industry. Contents: Gas compositions, the main direction of their processing and use. Production of sulfur and other commercial products from gases. Production of	5			**v**			**v**	

		commercial fuels, lubricants and special products; requirements for commercial products; compounding; liquefied gases; liquid fuels and additives to them; oils, scope of application; plastic lubricants, their main types. Features of efficient processing of hydrocarbon gases into multi-tonnage products, construction of technological and energy schemes of large-tonnage energy-intensive chemical industries.								
8	Economics and management of pipeline transportation of hydrocarbons	Purpose: to prepare undergraduates for effective management and economic analysis of pipeline transportation of hydrocarbons Content: The discipline covers the theoretical foundations of cost and profitability analysis: - financial planning and budgeting; - economic efficiency and profitability of projects	5	**v**					**v**	

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 06.03.2025 Minutes № 10

WORKING CURRICULUM

Academic year	**2025-2026 (Autumn, Spring)**
Group of educational programs	**M210 - "Transmission system and infrastructure"**
Educational program	**7M07146 - "Gas Engineering"**
The awarded academic degree	**Master of Technical Sciences**
Form and duration of study	**full time (scientific and pedagogical track) - 2 years**

Discipline code	Name of disciplines	Block	Cycle	Total ECTS credits	Total hours	lek/lab/pr Contact hours	in hours SIS (including TSIS)	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	4 sem	
CYCLE OF GENERAL EDUCATION DISCIPLINES (GED)													
CYCLE OF BASIC DISCIPLINES (BD)													
M-1. Module of basic training (university component)													
LNG213	Foreign language (professional)		BD, UC	3	90	0/0/30	60	E	3				
HUM214	Psychology of management		BD, UC	3	90	15/0/15	60	E	3				
HUM212	History and philosophy of science		BD, UC	3	90	15/0/15	60	E		3			
HUM213	Higher school pedagogy		BD, UC	3	90	15/0/15	60	E		3			
M-2. Gas Engineering Basic Training Module													
PET200	Strength and stability of inclined-horizontal multi-barrel wells	1	BD, CCH	5	150	30/0/15	105	E	5				
PET201	Design of systems for the development of hydrocarbon deposits	1	BD, CCH	5	150	30/0/15	105	E	5				
MNG781	Intellectual property and research	1	BD, CCH	5	150	30/0/15	105	E	5				
PET203	Technological modes of operation of gas transmission systems	2	BD, CCH	5	150	30/0/15	105	E	5				
PET205	Automation of design of pipeline transport systems	2	BD, CCH	5	150	30/0/15	105	E	5				
PET287	Innovative technologies for the construction and repair of gas storage facilities	1	BD, CCH	5	150	30/0/15	105	E			5		
PET288	Control of corrosion processes in the gas transmission system	1	BD, CCH	5	150	30/0/15	105	E			5		
MNG782	Sustainable development strategies	1	BD, CCH	5	150	30/0/15	105	E			5		
M-4. Practice-oriented module													
AAP273	Pedagogical practice		BD, UC	8				R			8		
CYCLE OF PROFILE DISCIPLINES (PD)													
M-3. Gas Engineering Professional Activity Module													
PET279	Computer technologies for solving problems of pipeline transport		PD, UC	5	150	30/0/15	105	E	5				
PET280	Calculation of strength, stability and displacement of underground pipelines		PD, UC	5	150	15/0/30	105	E	5				
PET281	Reliability and safety of main pipelines		PD, UC	5	150	30/0/15	105	E		5			
Pet286	Information technologies in the gas transmission system		PD, UC	5	150	30/0/15	105	E		5			
PET282	Modern concepts of risk assessment and management in the gas industry	1	PD, CCH	5	150	30/0/15	105	E		5			
PET283	Methods and algorithms for solving applied problems of pipeline transportation of oil and gas.	1	PD, CCH	5	150	30/0/15	105	E		5			
PET284	Management of gas transmission systems	2	PD, CCH	5	150	30/0/15	105	E		5			

PET285	Economics and management of pipeline transportation of hydrocarbons	2	PD, CCH	5	150	30/0/15	105	E		5			
PET278	Monitoring of pipeline transport equipment		PD, UC	5	150	30/0/15	105	E			5		
PET289	Technological reliability of pipeline systems	1	PD, CCH	5	150	30/0/15	105	E			5		
PET290	Dispatch Decision Support Systems in Gas Pipeline Transport Management	1	PD, CCH	5	150	30/0/15	105	E			5		
PET291	Perspective processes of hydrocarbon gas	2	PD, CCH	5	150	30/0/15	105	E			5		
PET292	Chemistry and technology of organic substances (based on gas raw materials)	2	PD, CCH	5	150	30/0/15	105	E			5		
M-4. Practice-oriented module													
AAP269	Research practice		PD, UC	8				R				8	
M-5. Experimental research module													
AAP268	Research work of a master's student, including internship and completion of a master's thesis		RWMS	4				R	4				
AAP268	Research work of a master's student, including internship and completion of a master's thesis		RWMS	4				R		4			
AAP251	Research work of a master's student, including internship and completion of a master's thesis		RWMS	2				R			2		
AAP255	Research work of a master's student, including internship and completion of a master's thesis		RWMS	14				R				14	
M-6. Module of final attestation													
ECA212	Registration and protection of the master thesis		FA	8								8	
Total based on UNIVERSITY:									30	30	30	30	
									60		**60**		

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	20	15	35
PD	Cycle of profile disciplines	0	33	20	53
Total for theoretical training:		**0**	**53**	**35**	**88**
RWMS	Research Work of Master's Student				24
ERWMS	Experimental Research Work of Master's Student				0
FA	Final attestation				8
TOTAL:					**120**

Decision of the Educational and Methodological Council of KazNRTU named after K.Satpayev. Minutes № 3 dated 20.12.2024

Decision of the Academic Council of the Institute. Minutes № 3 dated 28.11.2024

Signed:

Governing Board member - Vice-Rector for Academic Affairs	Uskenbayeva R. K.
Approved:	
Vice Provost on academic development	Kalpeyeva Z. Б.
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