


«K.Kulazhanov Kazakh University of Technology and Business» JSC	EP 27/01-17-2025	
Educational program	Edition №4	

EDUCATIONAL PROGRAM

7M07253 Oil and gas business

Level: Master's (scientific and pedagogical)

Approved

by the Board of Directors of JSC

«K. Kulazhanov KazUTB» «02» 04.20.25,
protocol No. 3




Recommended

by the Academic Council of JSC

«K. Kulazhanov KazUTB» «28» 03.20.25,
protocol No. 8


Astana – 2025

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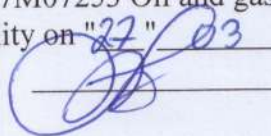
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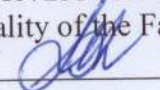
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Preface

The educational program «7M07253 Oil and gas business» was developed in accordance with the State Compulsory Standard of Higher Education / Postgraduate Education, approved by the order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022 No. 2, as well as on the basis of professional standards: Professional standard: Teacher (faculty) of higher and (or) postgraduate education organizations 20.11.2023; Oil and gas production technology 28.07.2023; Operation of oil and gas wells 06.12.2022

The educational program «7M07253 Oil and gas business» was approved at the meeting of the Council on Academic Quality on "27" 03 2025, protocol No. 4
Chairman L.K Baibolova 

The educational program «7M07253 Oil and gas business» was approved at the meeting of the Commission on Academic Quality of the Faculty on "29" 11 2024, protocol No. 2
Chairman G.S.Zhunosova 

The educational program «7M07253 Oil and gas business» was developed and discussed at the meeting of the department «Chemistry, Chemical Technology and Ecology» dated "22" 11 2024, protocol No. 5
Head of the department Zh.T.Nurtai 


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Approval sheet

Educational program " 7M07253 Oil and gas business"

AGREED:

Vice-Rector for Administrative Affairs		E. Askarbekov	" 27 " 03 2025 year
Head of Educational Programs Department		B. Bayadilova	" 27 " 03 2025 year
Director of «Astana Gas Service» LLP		K. Bagramova	" 20 " 11 2024 year
Director of «Institute of Chemistry, Coal and Technology» LLP		B. Yermagambet	" 20 " 11 2024 year
Director of «Scientific and Production Association "Energy-saving Technologies"» LLP		E. Zhatkanbayev	" 20 " 11 2024 year
Director of «KazGeoMap» LLP		R. Rakhmetulla	" 20 " 11 2024 year
Director of «Petrum» LLP		R. Romazanov	" 20 " 11 2024 year
Master's student NGDNPN-242		A. Abdrakhmanov	" 20 " 11 2024 year


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1 Passport of the educational program

International Standard Classification of Education (ISCED) level	7
National Qualification Framework (NQF) level	7
Sectoral Qualifications Framework (SQF) level	7
Code and name of the field of education	7M07 Engineering, manufacturing and construction industries
Direction of training	7M072 Industrial and manufacturing branches
Number and name of the group of educational programs	M115 Oil engineering
Code and name of the educational program (EP)	7M07253 Oil and gas business
Educational program profile	Scientific and pedagogical
Purpose of the educational program	Training of masters with a high level of professional culture who are able to solve modern scientific and practical problems in the field of the oil and gas industry, teach at universities, specialized colleges, carry out management activities at oil and gas industry enterprises.
Completion criterion of an educational program	At least 120 academic credits
Language of instruction of the educational program	Russian, Kazakh
Distinctive features of the educational program	-
Partner University	-

2 Qualification characteristics of a graduate of an educational program

Degree awarded	Master of Engineering Sciences in the educational program 7M07253 Oil and gas business
Field of professional activity	The graduate is intended to work in the following industries (areas): manufacturing enterprises, development of oil and gas fields, oil and gas refining industry, drilling of gas and oil wells, transportation of oil, oil products and gas.
Types of professional activities	Graduates of the educational program 7M07253 Oil and Gas Business can perform the following types of professional activities: - scientific research; - educational, pedagogical; - organizational and technological; - production and management; - design

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Object of professional activity	Main, field, interfield and process pipelines, institutes for the design of pumping and compressor stations for oil and gas pumping and field equipment, oil depots and gas storage facilities, main oil pipelines and gas networks.
Functions of professional activity	<p>Production and technological activity (PTA):</p> <ul style="list-style-type: none"> - documentation support for hydrocarbon raw material production - ensuring the technological mode of well operation - ensuring the performance of maintenance and repair work (hereinafter referred to as M&R), - organizational and management activities (OMA): <p>Research activities (R&D):</p> <ul style="list-style-type: none"> - plan and carry out theoretical, experimental and laboratory research, process the obtained results using modern information technologies; - carry out patent searches, study scientific and technical information, domestic and foreign experience on the research topic; - develop models of processes and phenomena, evaluate the reliability of the constructed models using modern methods and means of information analysis; - prepare reports on research work independently or as part of creative teams.

3 Requirements for the content of the educational program


Name of cycles and disciplines	Workload in academic credits
Cycle of basic disciplines (BD)	35
University component	20
Component of choice	15
Professional practice	53
Cycle of major disciplines (MD)	25
University component	20
Component of choice	13
Professional practice	24
Final certification	8
Total	120

4 Competency map of the educational program «7M07253 Oil and gas business»

Type of competence	Learning Outcomes Code	Learning outcome (according to Bloom's taxonomy)
Behavioral skills and personality traits (Softskills)	LO 1	Conducts research in the industrial field of technology based on a holistic systematic scientific worldview using knowledge of the history and philosophy of science
	LO 2	Participates in oral and written communications in a foreign language to solve problems of interpersonal and intercultural interaction in professional activities
	LO 3	Applies knowledge of psychology and methodological foundations of higher school pedagogy in planning professional and personal


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		development, training and socialization of students
Digital competencies (Digital skills)	LO 4	Uses methods and techniques for automating process control in the oil and gas industry, artificial intelligence technologies for their implementation, applying skills in working on process equipment equipped with automated and intelligent production process control systems
Professional skills (Hardskills)	LO 5	Selects and applies chemical reagents for the preparation of drilling fluids and flushing fluids during the production and transportation of crude oil, develops organizational and technical documentation on quality management, as well as analyzes experimental data, and processes technological processes in the oil and gas industry
	LO 6	Uses effective technologies for bottom-hole zone treatment, maintaining reservoir pressure to increase hydrocarbon production, surveying and deciphering well performance characteristics to increase gas and oil pipeline capacity
	LO 7	Develops measures aimed at increasing the efficiency of the hydrocarbon extraction process
	LO 8	Ensures efficient, stable and uninterrupted operation of the oil and gas production site, organizing the production and economic activities of the oil and gas production site with the interaction of all structural divisions, workshops and production units
	LO 9	Participates in the development of structures of production and technological, service and operational, and installation and adjustment units for oil and gas production, using the skills of collecting and systematizing data on technical supervision of the operation of drilling equipment in professional activities

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5 Learning outcomes of the educational program and modules


Key competencies	Learning Outcomes (LO) for the educational program	Name of module	Learning outcomes for the module	Name of disciplines that form learning outcomes
Behavioral skills and personality traits (Softskills)	LO1 Conducts research in the industrial field of technology based on a holistic systematic scientific worldview using knowledge of the history and philosophy of science LO2 Participates in oral and written communications in a foreign language to solve problems of interpersonal and intercultural interaction in professional activities LO3 Applies knowledge of psychology and methodological foundations of higher school pedagogy in planning professional and personal development, training and socialization of students	Modern problems of science and education	Applies philosophical knowledge to planning tasks of professional and personal development, the basis of a holistic systemic worldview using knowledge in the field of history and philosophy of science. Demonstrates the ability to communicate orally and in writing in a foreign language to solve problems of interpersonal and intercultural interaction.	History and philosophy of science Foreign language (professional)
Digital competencies (Digital skills)	LO4 Uses methods and techniques for automating process control in the oil and gas industry, artificial intelligence technologies for their implementation, applying skills in working on process equipment equipped with automated and	Digitalization, technology and management of oil and gas production processes	Demonstrates the ability to apply knowledge of psychology for the purposes of self-knowledge, solves psychological problems in management systems; Demonstrates the ability to apply the methodological foundations of higher education pedagogy, conduct scientific research and use professional knowledge for the socialization of young students. Demonstrates knowledge of the classification, types, purpose and main characteristics of typical control and measuring instruments, automatic and signaling devices at their installation location, design and operating principles. Applies skills in the application of methods for developing functional control and regulation systems	Management psychology Higher school pedagogy Pedagogical practicum Modern systems of digitalization and automation of processes in the oil and gas industry Unconventional hydrocarbons: prospecting,

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Professional skills (Hardskills)	intelligent production process control systems	Main pipelines and oil and gas storage facilities Processes in the oil and gas industry	for chemical-technological processes. Possesses the principles of constructing automated process control systems, standard systems of automatic regulation of technological processes, methods and means of automation of technological processes; Develops the technological part of the project of the enterprise of organic and petrochemical synthesis; selects and carries out technological calculations of chemical equipment, rational placement of chemical equipment Capable of carrying out the technological process in accordance with the technological regulations and using technical means to measure the main parameters of the technological process, properties of raw materials and products. Demonstrates knowledge of modern methods of chemical processing of hydrocarbons included in oil, gases, as well as technological processes of plants and installations, indicating the basic principles of processing hydrocarbon raw materials, the ways of further use of the resulting primary products Improves methods for conducting experimental studies of physical and chemical processes in oil and gas production Initiates the creation, development and implementation of chemical reagents for various purposes in oil and gas	exploration and development Trunk and technological gas and oil pipelines Methods and tools for diagnostics of compressor stations and the linear part of main gas pipelines Modern technologies for the production of fuels from oil and gas Modern problems of preparation of special solutions for oil and gas production Chemistry and technology of oil field Resource-saving technologies for natural gas transportation Methods of planning and processing experimental data in the oil and gas industry Modern oil refining
	LO5 Selects and applies chemical reagents for the preparation of drilling fluids and flushing fluids during the production and transportation of crude oil, develops organizational and technical documentation on quality management, as well as analyzes experimental data, and processes technological processes in the oil and gas industry	Basic operation and maintenance oil and gas production facilities		

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	<p>production.</p> <p>Main pipelines and oil and gas storage facilities</p> <p>Processes in the oil and gas industry</p> <p>Main pipelines and oil and gas storage facilities</p> <p>Digitalization, technology and management of oil and gas production processes</p> <p>Processes in the oil and gas industry</p>	<p>Applies technologies for servicing gas and oil pipelines and oil and gas storage facilities; is able to analyze equipment and set its operating mode</p> <p>Demonstrates knowledge of the theoretical foundations of physicochemical methods of analysis in the study of the physicochemical properties of substances.</p> <p>Understands the basics of modeling work processes, demonstrates knowledge of methods for calculating gas supply systems for enterprises and determining rational gas consumption, the purpose and design of wells, the purpose of casing columns, sizes and materials of casing pipes, gas drying, the choice of operating mode for gas drying units, technology for storing oil, gas and oil products at oil depots and gas storage facilities.</p> <p>Possesses knowledge of theoretical, methodological and practical aspects of production organization and their features in the oil and gas industry.</p> <p>Capable of classifying and selecting equipment with rational parameters for carrying out a technological process; performing necessary calculations; analyzing information, technical data</p> <p>Demonstrates knowledge of the theoretical foundations of physicochemical methods of analysis in the study of the physicochemical properties of substances, areas and boundaries of use of the main</p>	<p>technologies</p> <p>Oil and gas storage Research practicum</p> <p>Modern methods of physical and chemical research</p> <p>Modeling of work processes in the objects of diagnostics Purification of gases from mechanical impurities Testing and drying of gas pipelines Oil and gas storage</p> <p>Actual problems of organization and management of oil and gas production processes Technological equipment and units for oil and gas production</p> <p>Modern methods of physical and chemical research</p>
<p>LO6 Uses effective technologies for bottom-hole zone treatment, maintaining reservoir pressure to increase hydrocarbon production, surveying and deciphering well performance characteristics to increase gas and oil pipeline capacity</p>			
<p>LO7 Develops measures aimed at increasing the efficiency of the hydrocarbon extraction process</p>			

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<p>LO8 Ensures efficient, stable and uninterrupted operation of the oil and gas production site, organizing the production and economic activities of the oil and gas production site with the interaction of all structural divisions, workshops and production units</p>	<p>Main pipelines and oil and gas storage facilities</p> <p>Basic operation and maintenance oil and gas production facilities</p>	<p>methods of physicochemical analysis of chemical substances and reactions.</p> <p>Applies technologies for servicing gas and oil pipelines and oil and gas storage facilities; is able to analyze equipment and set its operating mode</p> <p>Initiates the creation, development and experimental testing of innovative technologies in the development and implementation of chemical reagents for various purposes in oil and gas production</p> <p>Able to use methods for calculating the main properties of oil (petroleum product) in design calculations, analyze the features of the composition and properties of gas, oil and petroleum products</p> <p>Demonstrates knowledge of the basic concepts of systems analysis, the main methods of planning an active experiment, decision-making theory, models and principles of implementing software and hardware to support decision-making, hydraulic and technological calculations of pipelines transporting oil, oil products and gas, issues of designing pipelines that pump a given annual volume of product over certain distances.</p> <p>Possesses knowledge of theoretical, methodological and practical aspects of production organization and their features in the oil and gas industry.</p>	<p>Oil and gas storage Purification of gases from mechanical impurities</p> <p>Modern problems of preparation of special solutions for oil and gas production Resource-saving technologies for natural gas transportation Chemistry and technology of oil field Modern oil refining technologies</p> <p>Trunk and technological gas and oil pipelines Methods and tools for diagnostics of compressor stations and the linear part of main gas pipelines Testing and drying of gas pipelines</p> <p>Actual problems of organization and management of oil and gas</p>
	<p>Digitalization, technology and management of</p>		

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	oil and gas production processes	<p>Capable of analyzing the conditions of geological development of regions of bitumen accumulation of unconventional hydrocarbons, uses knowledge in the field of features of the section of sedimentary formations, the main oil-bitumen-bearing complexes</p>	<p>production processes Unconventional hydrocarbons: prospecting, exploration and development Methods of planning and processing experimental data in the oil and gas industry</p>	
LO9 Participates in the development of structures of production and technological, service and operational, and installation and adjustment units for oil and gas production, using the skills of collecting and systematizing data on technical supervision of the operation of drilling equipment in professional activities	<p>Digitalization, technology and management of oil and gas production processes</p> <p>Processes in the oil and gas industry</p> <p>Main pipelines and oil and gas storage facilities</p>	<p>Possesses knowledge of the principles of operation and automatic control systems during the development and operation of oil and gas fields.</p> <p>Demonstrates knowledge of modern oil refining technology, intensification of oil refining processes, and in the area of development directions of oil refining as the main source of raw materials for petrochemical synthesis.</p> <p>Apply acquired knowledge to create models of oil and gas production processes based on available software tools.</p>	<p>Modern systems of digitalization and automation of processes in the oil and gas industry</p> <p>Modern technologies for the production of fuels from oil and gas</p> <p>Modeling of work processes in the objects of diagnostics</p>	

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6 The relationship between the attainability of the formed learning outcomes according to the educational program and academic disciplines

№	Name of the discipline	Brief description of the discipline	Number of credits	Formed learning outcomes (codes)							
				LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8
Cycle of basic disciplines											
University Component/Elective Component											
1	Foreign language (professional)	The purpose of the course is to acquire and improve competence in accordance with international standards of foreign language education, allowing the use of a foreign language as a means of communication in the intercultural, professional and scientific activities of the future master. The study of the discipline contributes to the training of highly qualified specialists who are able to compete in the labor market.	4		+						
2	History and philosophy of science	The purpose of studying the discipline is to philosophically comprehend science, comprehend the factual and ideological content of the stages of its development with the further use of acquired knowledge and skills in theoretical and practical professional activities. The course focuses on analyzing the main philosophical and methodological problems that arise in science at the present stage of its development, and gaining insight into the trends in the historical development of science.	4	+							
3	Higher school pedagogy	The objective of the course is aimed at developing pedagogical competence, mastering teaching methods and techniques, as well as modern educational technologies and their application in higher education practice. The course content covers the design and delivery of academic	4			+					

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special solutions for oil and gas production	of enhanced oil recovery, initiates the creation, development and experimental verification of innovative technologies in the development and implementation of various chemical reagents in oil and gas production, the use of chemical reagents for the preparation of drilling fluids and flushing fluid when drilling oil and gas wells.	5	+				+
8 Modern systems of digitalization and automation of processes in the oil and gas industry	The course studies methods and techniques for developing automatic control systems for technological processes in the oil and gas industry. Students acquire skills in using artificial intelligence to optimize and predict the operation of technological processes, improve management efficiency and ensure the reliability of systems; they will study the devices and operating principles of microprocessor technology in the development of block diagrams of programs for controllers for the purpose of controlling technical equipment and actuators	5		+			+
9 Modern oil refining technologies	The discipline is aimed at studying modern oil refining technologies, innovative techniques and methods in their implementation. Within the framework of the discipline, students will study the basic principles of deepening oil refining, acquire knowledge about modern problems of technology for processing oil residues into motor fuels, the main trends and modern problems of producing high-quality motor fuels	5		+			+
10 Chemistry and technology of oil field	The discipline forms knowledge about the composition and properties of oil systems, about experimental methods of their research, methods of separation and determination of the composition of hydrocarbon mixtures. As part of the study of the discipline, students will be able to use methods for calculating the basic properties of oil (petroleum product) in design calculations, analyze the characteristics of the composition and properties of gas, oil and petroleum	5		+			+

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	the production of fuels from oil and gas	processing; the main processes and technologies for the preparation and processing of oil and gas to produce various fuels. As part of the study of the discipline, students will be able to use methods for obtaining basic special-purpose products, analyze the fractional composition of oil and gas and the main options for flow schemes of oil and gas refining	5									
15	Technological equipment and units for oil and gas production	The discipline forms theoretical knowledge about the downhole technology of extracting hydrocarbons from the subsurface, the device, operation, repair, installation, calculation and design of machinery and equipment for the extraction and treatment of oil and gas. Students will be able to classify and select equipment with rational parameters for carrying out the technological process; carry out the necessary calculations; analyze information, technical data	5									
16	Testing and drying of gas pipelines	The discipline studies methods for improving the technology and calculation of the drying processes of gas pipelines, diagnostic tools for gas pipeline transport facilities. Students will acquire knowledge in the field of using methods for predicting work by types of drying of gas pipelines; methods for calculating the thermal balance of drying processes of gas pipelines; develops testing skills to determine the mechanical properties of gas pipelines	5								+	
17	Trunk and technological gas and oil pipelines	The discipline forms theoretical knowledge in the field of operation of gas and oil pipelines, mastering the theoretical foundations of calculation and design of such systems, and their subsequent maintenance. Students acquire knowledge of oil and gas transportation methods; develops skills in basic methods of hydraulic, thermal and mechanical calculation of pipelines, solve practical problems of designing and operating control systems for technological	5				+					+


Educational program	5	+	+	+	+
21 Purification of gases from mechanical impurities	The discipline studies the technological processes of purification of natural and associated gases, before and during transportation through main gas pipelines. Students receive theoretical knowledge on the basic technological schemes of purification plants, will be able to use modern gas purification equipment, will study the principles of operation, design features, methods of improving new technologies				

7 Alignment of planned learning outcomes with assessment technologies and teaching methods within the module

Learning Outcomes (LO) Number	Planned learning outcomes for the module	Assessment technologies (tools)	Methods of learning and teaching
LO1	Conducts research in the industrial field of technology based on a holistic systematic scientific worldview using knowledge of the history and philosophy of science Participates in oral and written communications in a foreign language to solve problems of interpersonal and intercultural interaction in professional activities	Abstract. Problem solving. Presentation, survey, colloquium, test assignments, research work. Creative work Project defense. Abstract. Problem solving, presentation. Survey, colloquium, test assignments. Submission of calculation and graphic work, research work.	Interactive lectures, training and discussions. Group work, game methods. Situational games, circle of time, philosophy of children. Rainbow groups. Brainstorming. Case study. Project. Portfolio, Round table, discussion, polemics, debate, "Get the question" method. Business and/or role-playing game. Multi-level tasks and assignments. "Fishbowle" method.
LO2	Applies knowledge of psychology and methodological foundations of higher school pedagogy in planning professional and personal development, training and socialization of students	Colloquium. Business and/or role play, case task, delivery calculation and graphic work, Research work. Creative work, independent work	Problem-solving method. Discussion. Associogram method. Work in small groups, Brainstorming method. Question and answer method.
LO4	Uses methods and techniques for automating process control in the oil and gas industry, artificial intelligence technologies for their implementation,	Presentation, survey, test, colloquium, tasks in test form. Research work, creative work.	Interactive lectures. Trainings. Discussions. Role-playing games, Situational games. Venn diagram, association method, cluster, dialogue




	applying skills in working on process equipment equipped with automated and intelligent production process control systems	Independent work, test work	learning, group work, brainstorming, video, project method
LO 5	Selects and applies chemical reagents for the preparation of drilling fluids and flushing fluids during the production and transportation of crude oil, develops organizational and technical documentation on quality management, as well as analyzes experimental data, and processes technological processes in the oil and gas industry	Round table, discussion, polemic, debate, colloquium. Interview, abstract. Essay, etc.	Interactive practical lesson (problem topics, business and role-playing games, case studies (analysis of specific circumstances), brainstorming. "Questions-answers-discussion". Strategic methods "INSERT"
LO 6	Uses effective technologies for bottom-hole zone treatment, maintaining reservoir pressure to increase hydrocarbon production, surveying and deciphering well performance characteristics to increase gas and oil pipeline capacity	Colloquium. Workbook, Creative task, essay	Interactive lectures, training and discussions. Group work, game methods. Situational games, circle of time, philosophy of children. Rainbow groups. Paired speech, listening trio, Jigsaw method, spectrum of values, distance.
LO 7	Develops measures aimed at increasing the efficiency of the hydrocarbon extraction process	Simulator, case task, creative assignment	Brainstorming. SWOT analysis. Case study. Controversy, dispute, debate
LO 8	Ensures efficient, stable and uninterrupted operation of the oil and gas production site, organizing the production and economic activities of the oil and gas production site with the interaction of all structural divisions, workshops and production units	Abstract. Problem solving. Presentation, survey, colloquium, test assignments, research work. Creative work	Interactive lectures. Trainings. Discussions. Role-playing games, Situational games. Venn diagram, association method, cluster, dialogue learning, group work, brainstorming, video, project method
LO 9	Participates in the development of structures of production and technological, service and operational, and installation and adjustment units for oil and gas production, using the skills of collecting and systematizing data on technical supervision of the operation of drilling equipment in professional activities	Project defense. Abstract. Problem solving, presentation. Survey, colloquium, test assignments. Submission of calculation and graphic work, research work. Creative work, independent work	Interactive practical lesson (problem topics, business and role-playing games, case studies (analysis of specific circumstances), brainstorming. "Questions-answers-discussion". Strategic methods "INSERT", "Bingo"

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8 Correlation of learning outcomes of the educational program with the labor functions of professional standards (if any)


Name of used professional standards	Professions by level 7	Labor functions	Tasks	Learning Outcomes by LO
"Oil and gas production technology" No. 125 dated 28/07/2023	Chief Technologist	Job Function 1: Developing activities, aimed at increasing efficiency mining process hydrocarbon raw materials	Task 1: Improving equipment efficiency Task 2: Improving the efficiency of hydrocarbon production	LO4 Uses methods and techniques for automating process control in the oil and gas industry, artificial intelligence technologies for their implementation, applying skills in working on process equipment equipped with automated and intelligent production process control systems LO7 Develops measures aimed at increasing the efficiency of the hydrocarbon extraction process
Requirements for personal competencies	Site Manager (Mining Industry)	Labor function 1: Provides effective, sustainable and uninterrupted operation of the oil production site and gas	Task 1:	LO4 Uses methods and techniques for automating process control in the oil and gas industry, artificial intelligence technologies for their implementation, applying skills in working on process equipment equipped with automated and intelligent production process control systems LO6 Uses effective technologies for bottom-hole zone treatment, maintaining reservoir pressure to increase hydrocarbon production, surveying and deciphering well performance characteristics to increase gas and oil pipeline capacity LO8 Ensures efficient, stable and uninterrupted operation of the oil and gas production site, organizing the production and economic activities of the oil and gas production site with the interaction of all structural divisions, workshops and production units LO9 Participates in the development of structures of production and technological, service and operational, and installation and adjustment


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units for oil and gas production, using the skills of collecting and systematizing data on technical supervision of the operation of drilling equipment in professional activities			
Labor function 2: Oil and Gas Production Site Management	Task 1: Provision production integrity, technological security taking into account information coming from objects, as well as continuous improvement for achieving high optimization level production	LO9 Participates in the development of structures of production and technological, service and operational, and installation and adjustment units for oil and gas production, using the skills of collecting and systematizing data on technical supervision of the operation of drilling equipment in professional activities	
Requirements for personal competencies			
" Professional standard: Teacher (faculty) of higher and (or) postgraduate education organizations" dated 20.11.2023 No. 591	Teacher, assistant in the field of education, OVPO	Skill 1: Ensuring the required level of academic competencies of students Skill 2: Ensuring the required level of professional competencies of students	LO2 Participates in oral and written communications in a foreign language to solve problems of interpersonal and intercultural interaction in professional activities LO3 Applies knowledge of psychology and methodological foundations of higher school pedagogy in planning professional and personal development, training and socialization of students
Leadership qualities Systematic and analytical thinking Stress resistance, responsibility Independent solution of professional problems using theoretical and practical knowledge Rational organization of work			

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	<p>Job Function 2: Conducting Scientific Research</p>	<p>Skill 1: Ensuring the integration of science, higher education and the labour market</p>	<p>LO1 Conducts research in the industrial field of technology based on a holistic systematic scientific worldview using knowledge of the history and philosophy of science LO5 Selects and applies chemical reagents for the preparation of drilling fluids and flushing fluids during the production and transportation of crude oil, develops organizational and technical documentation on quality management, as well as analyzes experimental data, and processes technological processes in the oil and gas industry</p>
		<p>Skill 2: Developing the required level of research skills in students</p>	<p>LO4 Uses methods and techniques for automating process control in the oil and gas industry, artificial intelligence technologies for their implementation, applying skills in working on process equipment equipped with automated and intelligent production process control systems LO9 Participates in the development of structures of production and technological, service and operational, and installation and adjustment units for oil and gas production, using the skills of collecting and systematizing data on technical supervision of the operation of drilling equipment in professional activities</p>
<p>Labor function 3: Socialization of studying youth</p>		<p>Skill 1: Promoting Social Values in the Student Environment</p>	<p>LO1 Conducts research in the industrial field of technology based on a holistic systematic scientific worldview using knowledge of the history and philosophy of science LO3 Applies knowledge of psychology and methodological foundations of higher school pedagogy in planning professional and personal development, training and socialization of students</p>

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Requirements for personal competencies		Skill 2: Introducing students to the values of the chosen profession
	Friendliness, sociability, empathy, stress resistance, emotional balance, professional and social responsibility, ability to develop teaching and research skills	PO2 Participates in oral and written communications in a foreign language to solve problems of interpersonal and intercultural interaction in professional activities RO5 Possesses the skills of conceptual, logical and analytical thinking, applying modern scientific methods and means of cognition for intellectual improvement and cultural development, enhancing professional competence

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9 Graduate model

GRADUATE MODEL			
Professional standard "Operation of oil and gas wells"	Competencies (Soft skills, digital skills)		
	Attributes of a graduate	Knowledge	Skills
	<ol style="list-style-type: none"> 1. Organization and coordination of works at the oil and gas production site 2. Capable of providing management of an oil and gas production site 3. Organizes production and economic activities of the oil and gas production site, interaction of all structural divisions, workshops and production units 	<ol style="list-style-type: none"> 1. Prospects for technical and economic development of the industry; 2. Management methods, technology and organization of production; 3. The procedure for drawing up and coordinating business plans for the production, economic and financial activities of the organization; 4. Modern methods of economic management and production management 	<ol style="list-style-type: none"> 1. Ensures the correct combination of economic and administrative management methods, increased production efficiency, responsibility of each employee for the work assigned to him and the results of the work of the entire team; 2. Conducts basic activities to ensure safe conduct of the technological process and protection of the workers' bodies
	Professional skills (hard skills)		
<ol style="list-style-type: none"> 1. Ensures efficient, stable and uninterrupted operation of the oil and gas production site 2. Exercises control over the optimal use of injection of chemical reagents at the field's technological facilities and the execution of the contract for the supply of chemicals 3. Provides operational accounting of oil and gas produced by wells based on well flow rate measurement data for liquid using a group metering unit, flow meters and other metering devices, taking into account the time the wells have worked and the percentage of water content 4. Ensures the procedure for accounting for technological losses of oil and gas condensate; 5. Takes measures to improve the organization of production, labor and management based on the introduction of the latest technical and telecommunication means for performing engineering and management work 6. Ensures compliance with the rules and regulations of occupational safety and health, the environment during operations at oil and gas fields, as well as the implementation of measures to improve the health of working personnel 7. Coordinate activities in the production planning process to ensure that all key production indicators are defined and applied at appropriate stages of each project and each modification work. 			

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Competencies (Soft skills, digital skills)		
Attributes of a graduate	Knowledge	Skills
1. Plans to carry out work on the automation of hydrocarbon extraction processes 2. Capable of analyzing and processing technical parameters of equipment for the extraction of hydrocarbon raw materials 3. Develop technical requirements for the design of newly constructed and reconstructed facilities using advanced technologies	1. Requirements of regulatory legal acts, administrative documents and technical documentation in the field of hydrocarbon production raw materials 2. Achievements of science and technology, advanced domestic and foreign experience in the field of hydrocarbon production 3. Fundamentals of inventive and rationalization activities	1. Make plans for the implementation of new technology and technologies 2. Use information technology 3. Read process diagrams, drawings and technical documentation for general and special purposes 4. Collection of operational information on the operation of oil and gas fields, oil, gas and water production, water injection, drilling, development, underground and capital repairs of wells 5. Monitor the operation of the well stock
Professional skills (hard skills)		
1. Conducts activities to prevent, eliminate (reduce) intercolumn pressures 2. Capable of developing draft technical specifications for connecting designed pipelines to existing pipelines in the event of declining production construction, reconstruction of wells, piping, oil and gas pipelines and shut-off valves 3. Conducts the organization and planning of new workshops and sections, their specialization, the development of new equipment, new high-performance technological processes 4. Calculates production capacity and equipment loading 5. Develop technical requirements for major repairs of hydrocarbon production facilities 6. Calculate the efficiency of upgrading equipment for the extraction of hydrocarbon raw materials		

Professional standard «Oil and Gas Production Technology»

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Competencies (Soft skills, digital skills)				
"Teacher (teaching staff) of higher and (or) postgraduate education organizations" <i>"Quality control of oil, gas and their processed products"</i>	Attributes of a graduate			
	Knowledge			
	Skills			
	<table border="1"> <tr> <td data-bbox="335 376 694 1003"> 1. Establishes feedback to undergraduate students using digital technologies 2. Uses modern and innovative (including digital) teaching technologies. 3. </td> <td data-bbox="694 376 1077 1003"> 1. Principles of pedagogical interaction with students; 2. Strategies and mechanisms of communication in the academic and professional environment. 3. Regulatory legal acts (including the National Qualifications System) in the field of higher education; 4. Mechanisms and principles of integration of psychological, pedagogical and subject (special) knowledge </td> <td data-bbox="1077 376 1503 1003"> 1. To involve students in public youth movements and organizations; 2. Involve employers in the process of training future specialists; 3. Develop and implement programs for advanced training courses for industry employees in the area of training; 4. Publish relevant articles in the media at various levels, social networks </td> </tr> </table>	1. Establishes feedback to undergraduate students using digital technologies 2. Uses modern and innovative (including digital) teaching technologies. 3.	1. Principles of pedagogical interaction with students; 2. Strategies and mechanisms of communication in the academic and professional environment. 3. Regulatory legal acts (including the National Qualifications System) in the field of higher education; 4. Mechanisms and principles of integration of psychological, pedagogical and subject (special) knowledge	1. To involve students in public youth movements and organizations; 2. Involve employers in the process of training future specialists; 3. Develop and implement programs for advanced training courses for industry employees in the area of training; 4. Publish relevant articles in the media at various levels, social networks
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	Professional skills (hard skills)			
	1. Develop teaching and methodological materials for the disciplines taught, taking into account the integration of education, science and innovation 2. Take part in the implementation of research and development work/creative projects 3. Involve undergraduate and graduate students in research and development work. 4. Interaction with stakeholders of higher and postgraduate education			

ЭКСПЕРТНОЕ ЗАКЛЮЧЕНИЕ

на образовательную программу «7M07253 – Нефтегазовое дело» магистратуры научно-педагогического направления

Образовательная программа «7M07253 – Нефтегазовое дело» учитывает положения действующих профессиональных стандартов и отвечает современным требованиям подготовки специалистов в области химико-технологических производств.

Целью образовательной программы является формирование у обучающихся глубоких профессиональных знаний, а также развитие аналитических и управленческих компетенций, необходимых для осуществления научных исследований, внедрения инновационных решений и эффективного управления технологическими процессами в нефтегазовой и смежных отраслях.

Содержание программы охватывает широкий спектр теоретических и прикладных дисциплин. Обучающиеся осваивают технологии органического синтеза, методы катализа, инженерный анализ, проектирование химических производств, а также подходы к оценке их экологической безопасности. Особое внимание уделяется изучению цифровых инструментов и решений, применяемых при управлении химико-технологическими системами, что способствует формированию компетенций, соответствующих требованиям цифровой трансформации отрасли.

Практико-ориентированный подход реализуется через организацию стажировок, выполнение лабораторных исследований и участие обучающихся в реальных производственных и научно-исследовательских проектах. Это способствует закреплению теоретических знаний и развитию практических навыков проектирования, оптимизации и анализа технологических процессов. В рамках программы предусмотрено активное взаимодействие с научными центрами и промышленными предприятиями, что обеспечивает высокое качество профессиональной подготовки и способствует интеграции университета в научно-производственную среду.

Важной особенностью программы является возможность индивидуализации траектории обучения путём выбора элективных дисциплин, что позволяет учитывать профессиональные интересы и карьерные цели магистрантов. Образовательная программа обеспечивает сбалансированное сочетание фундаментальной теоретической подготовки и практико-ориентированных навыков, что делает её актуальной, конкурентоспособной и соответствующей современным требованиям высшего образования.

С учётом вышеуказанных факторов, высокого уровня содержания, ориентации на современные тенденции развития химико-технологической отрасли, образовательную программу «7M07253 – «Нефтегазовое дело» целесообразно рекомендовать к реализации в образовательном процессе.

Директор
ТОО «Petrum»



Ромазанов Р.

ЭКСПЕРТНОЕ ЗАКЛЮЧЕНИЕ

**на образовательную программу «7М07253 – «Нефтегазовое дело»
на 2025-2027 год**

Образовательная программа «Нефтегазовое дело» направлена на подготовку высококвалифицированных специалистов – магистров, обладающих глубокими теоретическими знаниями и практическими навыками в области нефтегазовой промышленности. Программа ориентирована на формирование профессиональной культуры и компетенций, позволяющих выпускникам эффективно решать современные научные и производственные задачи, а также вести преподавательскую и управленческую деятельность на предприятиях отрасли.

Цель программы сформулирована четко и соответствует требованиям современного рынка труда нефтегазового сектора. Подготовка магистров с высоким уровнем профессиональной культуры, способных к решению научно-практических проблем, преподаванию и управлению, полностью отвечает потребностям промышленности и научного сообщества.

Особенно важно, что программа учитывает многоаспектность деятельности специалиста в нефтегазовой сфере: от технических аспектов добычи и переработки до педагогической и управленческой деятельности. Это соответствует профессиональным стандартам: Педагог (преподаватель вузов и колледжей); Технология добычи нефти и газа; Эксплуатация нефтегазовых скважин.

Таким образом, заявленная цель программы отвечает требованиям актуальных профессиональных стандартов, что гарантирует востребованность выпускников на рынке труда и возможность их успешной профессиональной реализации.

Анализ структуры и содержания дисциплин

Программа включает в себя комплекс дисциплин, охватывающих ключевые направления современного нефтегазового дела. В целом, состав дисциплин обеспечивает комплексный подход к подготовке магистров, гармонично сочетая фундаментальные научные знания с прикладными навыками и управленческими компетенциями.

Указанные в программе профессиональные стандарты полностью интегрированы в учебный процесс, что свидетельствует о высоком уровне соответствия программы требованиям рынка труда и государственным нормативам. Это также обеспечивает возможность выпускникам эффективно работать в различных ролях: от научных сотрудников и технологов до преподавателей и руководителей производственных подразделений.

Рекомендации и заключение

Образовательная программа «Нефтегазовое дело» обладает высоким потенциалом для подготовки конкурентоспособных специалистов, способных отвечать современным вызовам нефтегазовой отрасли. Программа демонстрирует баланс между фундаментальной теорией и практическими навыками, что способствует формированию универсальных компетенций выпускников.

Для дальнейшего развития программы целесообразно рассмотреть следующие рекомендации:

Усилить междисциплинарную интеграцию, включая модули по цифровым технологиям и автоматизации в нефтегазовой промышленности.

Развивать практическую направленность через сотрудничество с ведущими предприятиями отрасли, внедрение стажировок и проектов с реальными производственными задачами.

Обновлять учебный контент в соответствии с динамично меняющимися технологическими трендами и экологическими требованиями отрасли.

В целом, программа соответствует современным требованиям, ориентирована на развитие исследовательских и профессиональных навыков и готовит магистров, способных успешно реализовываться в научной, образовательной и производственной сферах нефтегазового дела.

Эксперт К.Баграмова
Директор
ТОО «Astana Gas Service»



ЭКСПЕРТНОЕ ЗАКЛЮЧЕНИЕ

на образовательную программу 7М07253 – «Нефтегазовое дело»
на 2025-2027 год

АО «Казахский университет технологии и бизнеса им. К.Кулажанова»

Образовательная программа, каталог элективных дисциплин разработаны в соответствии с требованиями Государственного общеобязательного стандарта высшего и послевузовского образования, утвержденный приказом Министра науки и высшего образования Республики Казахстан от 20 июля 2022 года № 2, а также на основе профессиональных стандартов: «Технология добычи нефти», «Эксплуатация нефтегазовых скважин».

Срок освоения образовательной программы магистра специальности 7М07253 – «Нефтегазовое дело» составляет 2 года. Целью образовательной программы является подготовка высококвалифицированных специалистов, способных проектировать, организовывать и управлять производственными процессами в сфере нефтегазовой промышленности, эффективно решать инженерно-технические и аналитические задачи, а также внедрять инновационные и устойчивые технологии в условиях современных вызовов отрасли и глобального энергетического перехода.

Программа ориентирована на подготовку специалистов, способных решать инженерно-технологические и управленческие задачи в области добычи, транспортировки, переработки и хранения углеводородов, а также осуществлять научно-исследовательскую деятельность в рамках национальных и международных проектов. Образовательный процесс включает фундаментальные и прикладные дисциплины, направленные на развитие профессиональных компетенций в сфере бурения, эксплуатации скважин, промышленной безопасности, устойчивого развития и цифровизации производств. Это обеспечивает соответствие содержания программы актуальным требованиям рынка труда. Данная ОП создает все необходимые условия для формирования у магистрантов необходимых знаний, навыков и компетенций для успешной карьеры в данной области.

Особенностью программы является интеграция теории с практикой: магистранты проходят обучение с привлечением реальных кейсов, выполняют проектные задания, стажироваются на профильных предприятиях. Каталог элективных дисциплин предоставляет широкие возможности для формирования индивидуальной образовательной траектории с учетом интересов обучающихся и потребностей отрасли.

Программа способствует подготовке квалифицированных специалистов, обладающих высокой профессиональной мобильностью, цифровыми навыками и ответственным отношением к вопросам экологии и устойчивого развития.

