Федеральное государственное автономное образовательное учреждение высшего образования
Российский университет дружбы народов

Инженерная академия

Принято
Ученым советом
инженерной академии
Протокол № 2022-08/08
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Утверждаю
Проректор
по образовательной деятельности
_____ Ю.Н. Обзеева
«___» _____ 2021 г.

Основная профессиональная образовательная программа высшего образования

Направление подготовки

Нефтегазовое дело

Программа разработана в соответствии с требованиями:

ОС ВО РУДН, утвержденным приказом ректора от «21» мая 2021 г. № 371 «Об утверждении актуализированных образовательных стандартов высшего образования, самостоятельно устанавливаемых Российским университетом дружбы народов, по уровням подготовки бакалавриата, специалитета и магистратуры».

Квалификация выпускника: Магистр

Направленность программы: **Oil and Gas Engineering / Технологии добычи и транспортировки нефти и газа**

Срок освоения программы: в очной форме – 2 года

Форма обучения: очная

Сведения об особенностях реализации основной профессиональной образовательной программы: реализуется на английском языке

Руководитель программы:	Согласовано:	Согласовано:
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2021 г.

General characteristics of the educational program 21.04.01 Oil and Gas Engineering – Oil and gas production and transportation technologies

1.1. The purpose (mission) of the educational program

The mission of the educational program "Oil and gas production and transportation technologies" in the field of training 21.04.01 Oil and gas engineering is the formation of a highly qualified, competent graduate in demand on the labor market.

The main goal of the educational program is to develop students' personal qualities, as well as to form general cultural (universal), general professional and professional competencies in accordance with the requirements of the OS VO RUDN / FGOS VO in the direction of training 21.04.01 Oil and gas engineering.

In the field of training students in the field of training 21.04.01 Oil and gas engineering: obtaining a higher (at the master's level) education, which allows a graduate to work successfully in the oil and gas sector, to have universal, general professional and professional competencies that contribute to his social mobility and competitiveness in the market labor taking into account the specifics of the region.

In the field of personality upbringing, the goal of EP VO is the formation of social and personal qualities of students: purposefulness, organization, hard work, responsibility, citizenship, communication, patriotism, tolerance.

The implementation of a competent approach in the formation of graduates' competencies is ensured by a combination of educational and extracurricular work, a socio-cultural environment.

Students acquire the skills of research and technological work, allowing them to carry out professional activities in managerial positions in Russian and international organizations of the oil and gas complex, as well as in research organizations.

1.2. Basic information.

The main professional educational program in the specialization 21.04.01 Oil and Gas Engineering – Oil and gas production and transportation technologies (master's level) is implemented in full-time education in accordance with the license for the right to carry out educational activities.

The main professional educational program in the specialization 21.04.01 Oil and Gas Engineering - Oil and gas production and transportation technologies (master's level) is implemented in full-time education in accordance with the license for the right to carry out educational activities.

The period of education under the program is 2 years.

The volume of the program is 120 credits. The volume of graduate programs, implemented in one school year is 60 credits.

1.3. Features of the implementation of the educational program

The educational program is implemented without the use of a network form, without the use of distance educational technologies, using e-learning elements through the RUDN Telecommunication Educational and Information System (TUIS).

Within the framework of the master's program in blocks B.1 and B.2, a compulsory part (consisting of a basic and variable components) and a part formed by participants in educational relations (an elective component) are distinguished. Block B.3 is fully related to the compulsory part of the educational program.

The structure of the master's program «Oil and gas production and transportation technologies» in the direction 21.04.01 Oil and gas engineering includes the following blocks:

Block 1 "Disciplines (modules)";

Block 2 "Practice";

Block 3 "State final certification".

Table 1

Structure and scope of the master's program

Structure of the Master's program		The volume of the master's program and its blocks in c.u.
Block 1	Disciplines (modules)	75
Block 2	Practice	33
Block 3	State final certification	12
Scope of the Master's program		120

Educational activities under the master's program are carried out in English.

1.4. The demand of the labor market for graduates of this educational program

Graduates who have mastered this program are oriented to work at any enterprises of the oil and gas complex: designated firms, oil and gas companies, and organizations operating pipeline transport, research centers, and higher educational institutions.

1.5. Requirements for the applicant.

For admission to the program, the Admission Rules are validated, approved by the relevant local regulatory act and posted in the public domain on the official website of RUDN University.

1.6. Characteristics of the professional activities of the graduate of OP:

1.6.1 Area of professional activity.

Areas of professional activity and (or) areas of professional activity in which graduates who have mastered the master's program can carry out professional activities:

01 Education and science (in the fields of: vocational training, vocational education, additional education; scientific research);

19 Oil and gas production, processing, transportation (in the areas of: monitoring, managing and carrying out diagnostics, maintenance, repair and operation of oil and gas equipment; monitoring and managing work while drilling wells in the fields; managing production activities of the oil and gas overhaul unit wells; managing the process of geo - navigation support for drilling oil and gas wells; providing and monitoring technology for oil, gas and gas condensate ; guidance on the geological support of underground gas storages; management of compliance with the technology and organization of operations for the operation of underground gas storage equipment; organization of dispatch and technological management within the service of the organization of the oil and gas industry; management of production and diagnostics on the linear part of gas pipelines; organization of work on operation of gas transmission equipment; organization of activities of the oil depot; monitoring the technical condition of the equipment of facilities for the reception, storage and shipment of oil and oil products; organization of work on the operation of gas distribution stations; management of gas transmission equipment diagnostics; emergency recovery and repair manuals for gas facilities; control and organization of work on corrosion protection of the internal surfaces of oil and gas complex equipment);

1.6.2 Object of professional activity.

The objects of professional activity of graduates who have mastered the master's program are:

- State and private organizations involved in the processes of exploration and production of hydrocarbons; construction, rehabilitation and reconstruction of wells on land and at sea; processing, storage and transportation of hydrocarbons;
- Foreign oil and gas companies;
- Research, design, engineering and educational organizations and institutions;
- Other objects of related types of professional activity.

1.6.3 Types of tasks of professional activity.

Types of tasks of professional activity for which graduates who have mastered the master's program are preparing:

Research (major) ;

Technological.

1.6.4 Tasks of professional activity.

A graduate who has mastered a master's program, in accordance with the types of tasks of professional activity, to which the educational program is oriented, is ready to solve the following professional problems:

Research activity:

- conduct applied research on the problems of the oil and gas industry, evaluate the possible use of the achievements of scientific and technological progress in the oil and gas industry;
- participate in the development and pilot testing of innovative technologies for oil and gas production;
- develop and justify technical, technological, technical and economic, socio-psychological and other necessary indicators characterizing technological processes, objects, systems, projects, oil and gas organizations;
- To develop physical, mathematical and computer models of the studied processes, phenomena and objects related to the professional sphere;
- to improve and develop methods for analyzing information on technological processes and the operation of technical devices in the areas of well drilling, oil and gas production, field monitoring and regulation of hydrocarbon extraction on land and at sea, oil and gas pipelines, underground gas storage, oil storage and marketing , petroleum products and liquefied gases;
- Create new and improve modeling techniques and calculations necessary for the design of technological processes and technical devices of the industry; - improve and develop new methods for experimental studies of the physical processes of oil and gas production and technical devices;
- conduct patent research in order to ensure patent cleanliness of new developments;
- To collect, process, analyze and systematize scientific and technical information on the topic of research, the choice of methods and means of solving the problem;
- carry out the preparation of scientific and technical reports, reviews, publications based on the results of research;
- develop models of design solutions for quality management in the oil and gas industry;
- develop systems for ensuring industrial and environmental safety of facilities, equipment and technologies for oil and gas production;

Technological activity:

- analyze and summarize the experience of developing new technological processes and technological equipment in the oil and gas industry;
- carry out regulated and introduce new technological processes for oil and gas production and oil and gas transportation, record and analyze the results of these processes;
- apply new and improve the regulated methods of operation and maintenance of technological equipment used in oil and gas production and oil and gas transportation;

- conduct a multi-criteria assessment of the benefits from the implementation of technological processes, projects, and the work of the oil and gas organization;

- assess innovative risks when introducing new technologies, equipment, systems.

1.6.5. Professional standards

The list of professional standards that correspond to the professional activities of graduates who have mastered the educational program in the direction of 21.04.01 Oil and gas engineering:

19.003 Oil refinery equipment maintenance and repair specialist

19.007 Oil, Gas and Gas Condensate Production Specialist

19.026 Specialist in technical control and diagnostics of objects and structures of the oil and gas complex

19.045 Oil and gas wells workover specialist

1.7. Requirements for the results of the development of the educational program:

As a result of mastering the educational program, the following general cultural, general professional and professional competencies are formed at the graduate:

Master's program graduate should possess the following universal competencies (UK):

- ability to carry out a critical analysis of problem situations based on a systematic approach, to develop an action strategy (UK-1);

- ability to manage the project at all stages of its life cycle (UK-2);

- ability to organize and manage the work of the team, developing a team strategy to achieve the goal (UK-3);

- ability to apply modern communication technologies, including in a foreign language (s), for academic and professional interaction (UK-4);

- ability to analyze and take into account the diversity of cultures in the process of intercultural interaction (UK-5);

- ability to determine and implement the priorities of their own activities and ways to improve them on the basis of self-esteem (UK-6);

- ability to:

search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from various sources in order to use effectively the information received to solve problems;

evaluate information, its reliability, build logical inferences based on incoming information and data (UK-7);

A graduate of a master's program should have the following general professional competencies (OPC):

- ability to solve production and / or research problems, based on fundamental knowledge in the oil and gas field (OPC-1);

- ability to carry out the design of technological processes, facilities in the oil and gas industry using computer technology (OPC-2);

- ability to develop scientific, technical, design and service documentation, draw up scientific and technical reports, reviews, publications, reviews (OPC-3);

- ability to find and process information required for decision-making in scientific research and in practical technical activities (OPC-4);

- ability to evaluate the results of scientific and technological developments, scientific research and justify their own choice, systematizing and summarizing achievements in the oil and gas industry and related fields (OPC-5);

- ability to participate in the implementation of basic and additional professional educational programs, using special scientific and professional knowledge (OPC-6);

A graduate of the program must have professional competencies (PC), corresponding to the types of professional activity that the master's program is focused on:

Research activity:

- ability to plan and conduct analytical, simulation and experimental studies, critically evaluate data and draw conclusions (PC-1);

Technological activity:

- ability to analyze and summarize data on the operation of technological equipment, to monitor, technical support and control of technological processes in the oil and gas industry (PC-2);
- ability to provide safe and efficient operation and operation of technological equipment of the oil and gas industry (PC-3).

1.8. Competency matrix

	Name of disciplines (modules)	Universal and general professional competencies													
		UK-1. Ability to carry out a critical analysis of problem situations based on a systematic approach, to develop an action strategy	UK-2. Ability to manage the project at all stages of its life cycle	UK-3. Ability to organize and manage the work of the team, developing a team strategy to achieve the goal	UK-4. Ability to apply modern communication technologies, including in a foreign language (s), for academic and professional interaction	UK-5. Ability to analyze and take into account the diversity of cultures in the process of inter-cultural interaction	UK-6. Ability to determine and implement the priorities of their own activities and ways to improve them on the basis of self-esteem	UK-7. Ability to: search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from various sources in an	OPC-1. Ability to solve production and / or research problems, based on fundamental knowledge in the oil and gas field	OPC-2. Ability to carry out the design of technological processes, facilities in the oil and gas industry using computer technology	OPC-3. Ability to develop scientific, technical, design and service documentation, draw up scientific and technical reports, reviews, publications, reviews	OPC-4. Ability to find and process information required for decision-making in scientific research and in practical technical activities	OPC-5. Ability to evaluate the results of scientific and technological developments, scientific research and justify their own choice, systematizing and summarizing achievements in the oil and gas industry and related fields	OPC-6. Ability to participate in the implementation of basic and additional professional educational programs, using special scientific and professional knowledge
Block 1	**Mandatory courses**														
	Базовая компонента														
Б1.О.01	Иностранный / Русский язык (как иностранный) в профессиональной деятельности / Foreign / Russian language (as a foreign language) in professional activity				+	+									
Б1.О.02	История и методология недропользования / History and methodology of subsoil use						+							+	
	Вариативная компонента														

Б1.О.03	Информационные технологии в нефтегазовом комплексе / Information technology in the oil and gas industry				+			+			+	+		
Б1.О.04	Системный анализ и математическое моделирование в нефтегазовом деле / System analysis and mathematical modeling in oil and gas engineering	+						+	+					
Б1.О.05	Экономика и управление нефтегазовым производством / Economics and management of oil and gas production			+								+		+
Б1.О.06	Управление проектами в нефтегазовой отрасли / Project management in the oil and gas industry		+							+				
Б1.О.07	Системы поддержания пластового давления с применением многоступенчатых лопастных насосов / Pressure maintenance systems using multistage vane pumps													
Б1.О.08	Одновременно-раздельная эксплуатация скважин / Dual completion of well for production													
Б1.О.09	Технология и техника водогазового воздействия на пласт / Technology and technology of water-gas impact on the reservoir								+					
Б1.О.10	Программный комплекс оценки надежности погружного оборудования по эксплуатационным данным / Software complex for assessing the reliability of submersible equipment from operational data									+				
Б1.О.11	Установки погружных лопастных насосов для добычи нефти / Installation of submersible pumps for oil production											+	+	
Б1.О.12	Универсальная методика подбора установок погружных лопастных насосов для добычи нефти / Universal method of selection of installations of submersible pumps for oil production													
Б1.О.13	Методы повышения ресурса УЭЦН / Methods of increasing the resource ESP												+	
Б1.О.14	Вывод скважин, оборудованных УЭЦН, на режим / Output of wells equipped with ESP to the mode													
Б1.О.15	Интеллектуализация добычи нефти / Oil production intellectualization													
Б1.О.16	Практикум применения данных дистанционного зондирования Земли в интересах различных отраслей промышленности (на рус. яз.) / Practical											+		

	application of the Earth remote sensing data in the interests of various branches of industry													
	The part formed by participants in educational relations													
	Элективная компонента													
Б1.В.ДВ.01.01	Объемные насосы для добычи вязкой нефти / Volumetric pumps for the extraction of viscous oil													
Б1.В.ДВ.01.02	Технология и техника добычи нефти установками погружных насосов в осложненных условиях / The technology and technique of oil production by submergible pumps in the complicated conditions													
Б1.В.ДВ.02.01	Эксплуатация скважин погружными гидроструйными насосами / Operation of wells by submersible hydro jet pumps													
Б1.В.ДВ.02.02	Циклическая эксплуатация скважин, оборудованных УЭЦН													
Б1.В.ДВ.03.01	Промысловая геофизика / Field Geophysics											+		
Б1.В.ДВ.03.02	Актуальное развитие добычи нетрадиционных углеводородов в мире / Current development of production of unconventional hydrocarbon in the world											+		
Б1.В.ДВ.04.01	Малогабаритные УЭЦН для боковых стволов / Small-sized ESP for sidetracks													
Б1.В.ДВ.04.02	Погружные лопастные насосы для добычи нефти / Immersible impeller pumps for oil production													
Б1.В.ДВ.05.01	Применение УЭЦН Colibri на кабеле													
	Block 2. Practice													
	Mandatory courses													
Б2.О.01	**Базовая компонента**													
Б2.О.01.01(У)	Научно-исследовательская работа (получение первичных навыков научно-исследовательской работы) / Research work (primary skills in research work)								+		+		+	+
Б2.О.01.02(У)	Технологическая практика (учебная) / Technological practice										+	+	+	
Б2.О.02	**Вариативная компонента**													
Б2.О.02.01(П)	Технологическая практика (производственная) / Technological practice										+	+	+	
Б2.О.02.02(П)	Научно-исследовательская работа / Research work								+		+		+	+
Б2.О.02.03(Пд)	Преддипломная практика / Undergraduate practice								+	+	+	+	+	
Block 3	**State final certification**													

Б3.01	Подготовка к сдаче и сдача государственного экзамена / Preparation for passing and passing the state exam	+	+	+	+	+	+	+	+	+	+	+	+	+	
Б3.02	Оформление, подготовка к процедуре защите и защита выпускной квалификационной работы / Registration, preparation for the procedure of protection and defense of final qualifying work	+	+	+	+	+	+	+	+	+	+	+	+	+	

	Name of disciplines (modules)	Professional competencies research, technological activities		
		PC-1. Ability to plan and conduct analytical, simulation and experimental studies, critically evaluate data and draw conclusions	PC-2. Ability to analyze and summarize data on the operation of technological equipment, to monitor, technical support and process control in the oil and gas industry	PC-3. Ability to provide safe and efficient operation and operation of technological equipment of the oil and gas industry
Block 1	**Mandatory courses**			
	Базовая компонента			
Б1.О.01	Иностранный / Русский язык (как иностранный) в профессиональной деятельности / Foreign / Russian language (as a foreign language) in professional activity			
Б1.О.02	История и методология недропользования / History and methodology of subsoil use			
	Вариативная компонента			
Б1.О.03	Информационные технологии в нефтегазовом комплексе / Information technology in the oil and gas industry			
Б1.О.04	Системный анализ и математическое моделирование в нефтегазовом деле / System analysis and mathematical modeling in oil and gas engineering	+		
Б1.О.05	Экономика и управление нефтегазовым производством / Economics and management of oil and gas production			
Б1.О.06	Управление проектами в нефтегазовой отрасли / Project management in the oil and gas industry	+		
Б1.О.07	Системы поддержания пластового давления с применением многоступенчатых лопастных насосов / Pressure maintenance systems using multistage vane pumps			+
Б1.О.08	Одновременно-раздельная эксплуатация скважин / Dual completion of well for production			+
Б1.О.09	Технология и техника водогазового воздействия на пласт / Technology and technology of water-gas impact on the reservoir		+	
Б1.О.10	Программный комплекс оценки надежности погружного оборудования по эксплуатационным данным / Software complex for assessing the reliability of submersible equipment from operational data		+	+
Б1.О.11	Установки погружных лопастных насосов для добычи нефти / Installation of submersible pumps for oil production		+	+
Б1.О.12	Универсальная методика подбора установок погружных лопастных насосов для добычи нефти / Universal method of selection of installations of submersible pumps for oil production	+		

Б1.О.13	Методы повышения ресурса УЭЦН / Methods of increasing the resource ESP	+	+	
Б1.О.14	Вывод скважин, оборудованных УЭЦН, на режим / Output of wells equipped with ESP to the mode			+
Б1.О.15	Интеллектуализация добычи нефти / Oil production intellectualization	+	+	
Б1.О.16	Практикум применения данных дистанционного зондирования Земли в интересах различных отраслей промышленности / Practical application of the Earth remote sensing data in the interests of various branches of industry			+
	The part formed by participants in educational relations			
	Элективная компонента			
Б1.В.ДВ.01.01	Объемные насосы для добычи вязкой нефти / Volumetric pumps for the extraction of viscous oil		+	+
Б1.В.ДВ.01.02	Технология и техника добычи нефти установками погружных насосов в осложненных условиях / The technology and technique of oil production by submergible pumps in the complicated conditions		+	+
Б1.В.ДВ.02.01	Эксплуатация скважин погружными гидроструйными насосами / Operation of wells by submersible hydro jet pumps		+	+
Б1.В.ДВ.02.02	Циклическая эксплуатация скважин, оборудованных УЭЦН		+	+
Б1.В.ДВ.03.01	Промысловая геофизика / Field Geophysics	+		
Б1.В.ДВ.03.02	Актуальное развитие добычи нетрадиционных углеводородов в мире / Current development of production of unconventional hydrocarbon in the world	+		
Б1.В.ДВ.04.01	Малогабаритные УЭЦН для боковых стволов / Small-sized ESP for sidetracks		+	+
Б1.В.ДВ.04.02	Погружные лопастные насосы для добычи нефти / Immersible impeller pumps for oil production		+	+
Б1.В.ДВ.05.01	Применение УЭЦН Colibri на кабеле		+	+
	Block 2. Practice			
	Mandatory courses			
Б2.О.01	**Базовая компонента**			
Б2.О.01.01(У)	Научно-исследовательская работа (получение первичных навыков научно-исследовательской работы) / Research work (primary skills in research work)	+	+	
Б2.О.01.02(У)	Технологическая практика (учебная) / Technological practice	+	+	+
Б2.О.02	**Вариативная компонента**			
Б2.О.02.01(П)	Технологическая практика (производственная) / Technological practice	+	+	+
Б2.О.02.02(П)	Научно-исследовательская работа / Research work	+	+	
Б2.О.02.03(Пд)	Преддипломная практика / Undergraduate practice	+	+	+

Block 3	**State final certification**			
Б3.01	Подготовка к сдаче и сдача государственного экзамена / Preparation for passing and passing the state exam	+	+	+
Б3.02	Оформление, подготовка к процедуре защите и защита выпускной квалификационной работы / Registration, preparation for the procedure of protection and defense of final qualifying work	+	+	+