

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
NATIONAL TECHNICAL UNIVERSITY
DNEPROVSK POLYTECHNICS

It has been reviewed and approved
Academic Council of the University
“05” 07 2018,
Protocol No 9.

HIGHER EDUCATION PROFESSIONAL PROGRAM
«Oil and Gas Engineering and Technology»

FIELD OF STUDY	18 Production and technologies
PROGRAM SUBJEKT AREA	185 Oil and Gas Engineering and Technology
LEVEL OF HIGHER EDUCATION	first
DEGREE	Bachelor`s
EDUCATIONAL QUALIFICATION	Bachelor of Oil and Gas Engineering and Technology
PROFESSIONAL QUALIFICATION (ISCO-08)	3117 Mining and Metallurgical Technicians

Enacted by Order of the Rector of the University
by «05» July 2018, No 9-AC.

The Dnipro
NTU «DP»
2018

ЛИСТ-ПОГОДЖЕННЯ

Центр моніторингу знань та тестування
протокол № _____ від «02» 07 2018 р.

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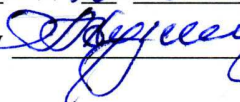
Відділ ліцензування та акредитації
протокол № _____ від «02» 07 2018 р.

Начальник відділу  Чалокіна Т.М.
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Науково-методичний центр
протокол № 7 від «02» 07 2018 р.

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Відділ забезпечення якості вищої освіти
протокол № 4 від «02» 06 2018 р.

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Науково-методичний відділ
протокол № 1 від «02» 07 2018 р.


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Відділ міжнародного співробітництва (заповнюється лише для програм, які запроваджуються для навчання іноземних громадян)

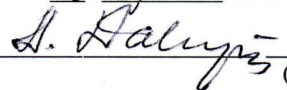
протокол № _____ від «02» 07 2018 р.

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Методична комісія спеціальності 185 Нафтогазова інженерія та технології
Протокол № 4 від «27» червня 2018 р.

Голова методичної комісії спеціальності  Караван С.А.
(підпис, ініціали, прізвище)


Кафедра техніки розвідки родовищ корисних копалин
протокол № 22 від «26» червня 2018 р.

Завідувач кафедри  Давиденко О.М.
(підпис, ініціали, прізвище)

Кафедра транспортних систем і технологій
Протокол № 22 від «26» червня 2018 р.

Завідувач кафедри  Мурін А.Н.
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PREFACE

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2 Sudakov Andrei, Professor of the Department of Technic Prospecting of Deposits.

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INTRODUCTION

The educational program is developed on the basis of the draft Higher Education Standard of Bachelor of Specialty Training 185 Oil and Gas Engineering and Technology

The educational program is used during:

- specialty licensing and educational program accreditation;
- preparation of curricula;
- formation of work programs of educational disciplines, practices, individual tasks;
- formation of individual curricula of students;
- development of diagnostic tools for the quality of higher education;
- certification of bachelors of specialty 185 Oil and gas engineering and technologies;
- determining the content of training in the system of retraining and advanced training;
- professional orientation of a qualifier;
- external quality control of training of specialists.

Users of educational and professional program:

- higher education students studying at NTU «DP»
- teachers of NTU “DP”, who train bachelors of specialty 185 “Oil and gas engineering and technologies»;
- specialty examination commission 185 Oil and gas engineering and technologies;
- admissions office NTU «DP»

The educational program extends to the departments of the University, which participate in the training of specialists of the bachelor's degree of specialty 185 Oil and gas engineering and technologies.

1 EDUCATIONAL PROGRAM PROFILE

1.1 general information	
Full name of higher education institution and institute (faculty)	National Technical University "Dniprovsk Polytechnic"
Higher education degree and title in the original language	Bachelor of Oil and Gas Engineering and Technology Professional qualification 3117.2 Technical specialist in the mining industry
The official name of the educational program	Oil and gas engineering and technologies
Type of diploma and scope of educational program	Bachelor's degree, 240 ECTS credits
Availability accreditation	The program was not accredited
Cycle / level	NQF Ukraine – 7 level, FQ-EHEA – first cycle, EQF-LLL – 6 7 level
Prerequisites	A person has the right to get a bachelor's degree subject to having a complete general secondary education
Language (s) of teaching	Ukrainian (English)
Duration of the educational program	The term may not exceed 3 years 10 months and / or accreditation period. Adjustments are allowed in accordance with changes in the regulatory framework of higher education
Internet address for the permanent description of the educational program	http://trkk.nmu.org.ua/ua/ . Specialty Information Package
1.2 The purpose of the educational program	
Training of specialists in the development of oil and gas fields and transportation of hydrocarbons, development and implementation of technologies for well drilling, production, industrial collection and preparation of hydrocarbons, transportation and storage of oil and gas	
1.3 Characteristics of the educational program	
Subject area	18 Production and technologies / 185 Oil and Gas Engineering and Technology graduation departments: - Technic Prospecting of Deposits. - Transport systems and technologies
Orientation of the educational program	Applied educational program
The main focus of the educational program	Special education in the field 18 Production and technologies / specialties 185 Oil and Gas Engineering and Technology. Keywords: well construction, extraction of oil, natural, transportation and storage of hydrocarbons
Features of the program	Educational, production and Pre-certification practices are required.
1.4 Suitability of graduates for employment and further education	
Suitability for employment	Types of economic activities by classifier CEA-2010: Section B. Part 06. Extraction of crude oil and natural gas, including activities for the exploitation of existing oil and gas fields and / or development of such fields. These activities include drilling, rigging and rigging; operation of separators, demulsifiers, equipment for desalination and transportation of crude oil; all other activities for the preparation of oil and gas for delivery from the place of extraction to the place of shipment.

	<p>Occupations and professional titles of work according to the State Classifier of Professions SQ 003:2010:</p> <p>Profession: 3117.1 Technical specialist in the mining industry 142 Mining Managers; 1222.2 Heads (other heads) and masters of production sites (divisions)</p> <p>Professional titles of works: 3117 Drilling Technician 3117 Oil and gas production technician 3117 Oil pipeline technician 3117 Technician for gas equipment operation 3117 Oil and gas preparation and transportation technician 1222.2 Drilling Master 1222.2 Master of gas filling station; 1223.2 Oil, Gas, and Condensate Master; 1222.2 Wells of Research Master; 1222.2 Master of linear pipeline operation; 1222.2 Master of gas equipment operation; 1222.2 Master of Gas preparation; 1222.2 Transport Repair Master; 1222.2 Master of the tank farm; 1222.2 Master of gas filling station workshop; 1222.2 Head of automobile gas filling station 1222.2 Head of gas filling station; 1222.2 Head of compressor station; 1222.2 Head of design department.</p>
Further training	Opportunity to study by qualification levels: NQF Ukraine – 8, level FQ-EHEA – second cycle, EQF-LLL – 7 level
1.5 Teaching and assessment	
Teaching and learning	Student centering training, self-study, problem-oriented learning
Evaluation	<p>Assessment of students' academic achievement is carried out on a rating scale (passable mark 60...100) and on an institutional scale (“excellent”, "good," "satisfactory," "unsatisfactory”), used to convert mobile student grades.</p> <p>Assessment includes the full range of control procedures, depending on the competency characteristics (knowledge, ability, communication, autonomy and responsibility) of the learning outcomes monitored.</p> <p>Student learning outcomes reflecting their level of competency achievement as expected, are identified and measured during control activities using criteria that correlate with the National Qualifications Framework descriptors and characterize the ratio of competency requirements and rating indicators to the rating scale..</p> <p>Final control of academic subjects is carried out on the basis of current control or / and evaluation of the performance of complex control work or / and oral answers</p>
The form of final certification	<p>Certification of higher education applicants is carried out in the form of public defense of the bachelor's qualification work.</p> <p>The qualification work is protected in public at a session of the Examination Committee.</p> <p>A special decision of the examination board on the basis of the assessment of the level of competence development, provided by the educational components according to the plan of the educational</p>

	process, may be awarded to the graduate professional qualification. Criteria for assignment of professional qualification: level of mastery of educational components with marks not less than 75 points, assessment for industrial practice in specialization not less than 75 points, protection of qualification work with marks not lower than 75 points.
1.6 Resources for program implementation	
Specific characteristics of staffing	Internships at oil and gas companies
Specific characteristics of logistics	Availability of specialized laboratories
Specific characteristics of information and training support	Availability of educational and methodological support of practices
1.7 Academic mobility	
National Credit Mobility	The program provides for academic mobility agreements with higher education institutions that train oil and gas engineering and technology professionals
International credit mobility	The program provides for agreements on academic mobility, on dual diploma at a mining university «Mountains Universität Leoben» / Field of study: MCKO (ISCED), code 071 Engineering and engineering professions (engineering trades)
Training of foreign higher education applicants	he program provides for the training of foreign higher education applicants, teaching in English

2 REGULATORY COMPETENCES

Integrated Bachelor's Degree in Specialty 185 Oil and Gas Engineering and Technology - ability to solve complex specialized problems and practical problems in professional activities related to the production, transportation and storage of hydrocarbon energy carrier or in a training process that involves the application of certain theories and methods of oil and gas mechanics and is characterized by the complexity and uncertainty of the conditions.

2.1 General competences

Code	Competencies
<i>1</i>	<i>2</i>
GC1	Ability to abstract think, analyze and synthesize elements of technical systems for oil, gas production, transportation and storage.
GC 2	Knowledge and understanding of tasks of oil and gas engineering, understanding of peculiarities of professional activity in oil and gas industry.
GC 3	Ability to speak the state language both verbally and in writing in a professional activity.
GC 4	Ability to communicate in a professional language
GC 5	Use of information and communication technologies in oil and gas engineering.
GC 6	Ability to learn and master modern knowledge related to the implementation of modern oil and gas production, transportation and storage technologies
GC 7	Ability to work as a team in the operation of oil and gas objects.
GC 8	Skills for safe operation of oil and gas objects.
GC 9	Ability to realize their rights and responsibilities as a member of society, to realize the values of civil (free democratic) society and the need for its sustainable development, the rule of law, rights and freedoms of man and citizen in Ukraine
GC 10	Ability to preserve and multiply moral, cultural, scientific values and achievements of society on the basis of understanding of history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and technology, to use different types and forms of motor activity for active rest and healthy living

2.2 Special competences

Generic Object of Professional Activity - Hydrocarbon production, transportation, and storage technologies, equipment.

Code	Competencies
<i>1</i>	<i>2</i>
SC1	Ability to characterize geological processes and patterns of rock formation, including oil and gas deposits
SC 2	Understanding the general structure and interrelation of individual elements of Ukraine's hydrocarbon energy supply system
SC 3	Ability to apply knowledge of physics and chemistry to analyze the physicochemical properties of oil, condensate and natural gas
SC 4	Ability to apply knowledge of thermodynamics, hydraulics, and gas dynamics to analyze the processes of oil and gas movement in reservoirs, wells, industrial and main pipelines

<i>1</i>	<i>2</i>
SC 5	Ability to apply mathematical methods to the analysis of technological processes of production, drilling of wells, transportation and storage of oil and gas
SC 6	Ability to use state-of-the-art software for operational calculations of technological parameters of production, well drilling, transportation and storage of oil and gas
SC 7	Ability to apply the basics of materials science, machine mechanics to assess the technical state of the elements of technological equipment of systems of extraction, drilling, transportation and storage of oil and gas
SC 8	Ability to apply basic methods of analysis and evaluation of the state of the elements of oil and gas systems by means of technical diagnostics in industrial and laboratory conditions
SC 9	Ability to create elements of technical systems for the production, transportation and storage of oil and gas
SC 10	Understanding the general principles for choosing the means of control and automation of technological processes in the oil and gas industry
SC 11	Ability to analyze operating modes of an oil and gas facility, make optimal selection of process equipment, perform optimization of operating mode by a certain criterion
SC 12	Ability to perform technological and technical and economic evaluation of the efficiency of using basic oil and gas technologies and technical devices
SC 13	Ability to plan and organize the work of the structural unit of an oil and gas enterprise in accordance with the requirements of life safety and labor protection
SC 14	Ability to evaluate gas content of methane-coal deposits and create systems and technologies for their development

3 SELECTIVE COMPETENCES

3.1 Academic Bloc 1 «Construction of oil and gas wells»

Object of professional activity - systems and technologies for drilling of oil and gas wells.

Code	Competencies
<i>1</i>	<i>2</i>
SC 1.1	Ability to create drilling technology for oil and gas wells
SC 1.2	Ability to construct oil and gas wells
SC 1.3	Ability to calculate optimal drilling modes for oil and gas wells
SC 1.4	Ability to use in practice methods of diagnostics of the level of efficiency of the equipment for drilling of oil and gas wells
SC 1.5	Ability to ensure the safety of drilling operations in accordance with the operating rules
SC 1.6	Ability to evaluate and restore the quality of the process of construction of oil and gas wells
SC 1.7	Ability to regulatory and technical support for the processes construction of oil and gas wells
SC 1.8	Ability to organize work on the construction of oil and gas wells under the conditions of ensuring a high level of productivity, safety of work and minimal costs
SC 1.9	Ability to control the construction of oil and gas wells using modern methods of analysis and information processing
SC 1.10	Ability to plan components of technological and organizational activities and to manage the construction of oil and gas wells

<i>1</i>	<i>2</i>
SC 1.11	Ability to monitor organizational activity, efficiency, perfection and prospect of construction of oil and gas wells
SC 1.12	Ability to improve the technology construction of oil and gas wells and organizational activity in accordance with the requirements of modern production and competitive economy

3.2 Academic Bloc 2 «Transportation and storage of hydrocarbon energy»

The object of professional activity is systems and technologies of transportation and storage of hydrocarbons

Code	Competencies
<i>1</i>	<i>2</i>
SC 2.1	Ability to create elements of technologies for the production, transportation and storage of hydrocarbon energy
SC 2.2	Ability to designation operational parameters and design links of technological diagrams of coal mine transportation for specific mining and mining-geological conditions
SC 2.3	Ability to calculate optimal modes of operation of gas-oil supply systems for different operating conditions
SC 2.4	Ability to use in practice methods of diagnostics of the level of efficiency of gas-oil supply systems
SC 2.5	Ability to ensure the safety of components of gas and oil supply systems in accordance with the operating rules
SC 2.6	Ability to evaluate and restore quality indicators of gas-oil supply system elements for specific operating conditions
SC 2.7	Ability to regulatory and technical support of processes of creation, operation and restoration of systems and technologies of production of hydrocarbon energy carriers
SC 2.8	Ability to organize the operation of gas and oil supply systems under the conditions of ensuring a high level of productivity, safety of work and minimal costs
SC 2.9	Ability to control the functioning of gas and oil supply systems using modern methods of analysis and information processing
SC 2.10	Ability to plan components of technological and organizational activity and control of gas-oil supply systems
SC 2.11	Ability to monitor organizational activity, efficiency, perfection and prospects of gas-oil supply systems
SC 2.12	Ability to improve the technology of production, transportation and storage of carbohydrate energy and organizational activity in accordance with the requirements of modern production and competitive economy

4 REGULATORY CONTENT OF PREPARATION FORMED IN TERMS OF TRAINING RESULTS

The final, total and integrative results of the bachelor's degree in the specialty 185 Oil and Gas Engineering and Technology, defining the normative content of the training and correlating with the list of general and specific competences, below.

Code	Learning outcomes
1	2
Common learning outcomes	
CL 1	Demonstrate the ability to think abstractly, perform analysis in the development of technological and calculation schemes of elements of technical systems of extraction, drilling, transportation and storage of oil and gas.
CL 2	Demonstrate knowledge of the current state and deep understanding of the role of the oil and gas industry, professional activity in ensuring energy security of Ukraine.
CL 3	Demonstrate knowledge of technical terminology, the ability to logically express their thoughts in the official language, both orally and in writing.
CL 4	Demonstrate the ability to communicate in a foreign language, including basic knowledge of special terminology and skills in working with foreign technical publications.
CL 5	Demonstrate skills in the use of information and communication technologies to solve a specific engineering problem related to the implementation of basic oil and gas technologies for the extraction, drilling, transportation and storage of oil and gas.
CL 6	Demonstrate the ability to acquire new knowledge independently by using technical literature on paper and electronic media.
CL 7	Demonstrate the ability to acquire new knowledge independently by using technical literature on paper and electronic media.
CL 8	Demonstrate the ability to safely operate at oil and gas objects.
CL 9	To realize their rights and obligations as a member of society, to realize the values of civil (free democratic) society and the need for its sustainable development, the rule of law, rights and freedoms of man and citizen in Ukraine
CL 10	To preserve and increase moral, cultural, scientific values and achievements of the society on the basis of understanding of history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and technologies, to use different types and forms of motor activity for active rest and a healthy life
Special learning outcomes	
SL1	To characterize geological processes and basic patterns of rock formation, including oil and gas deposits
SL2	Explain the general structure, interconnection and functional purpose of individual elements of Ukraine's hydrocarbon energy supply system
SL3	Use basic concepts, basic laws of physics and chemistry to predict and analyze the physicochemical properties of oil, condensate and natural gas in the process of their extraction, drilling, transportation and storage
SL4	Perform calculations of the parameters of hydro-gas dynamic processes that accompany the movement of oil and gas in reservoirs / wells / industrial and main pipelines, taking into account the basic laws of thermodynamics, hydraulics and gas dynamics
SL5	Apply mathematical methods to determine the specific values of technological parameters of oil and gas wells, oil and gas preparation systems, industrial and main gas pipelines, gas storage facilities, other elements of the gas supply system
SL6	To apply modern software for design and operational calculations of parameters of technological processes of production, drilling of wells, transportation and storage of oil and gas
SL7	To analyze the technical condition of the elements of technological equipment of the systems of production, transportation and storage of oil and gas using methods based on the basics of materials science and machine mechanics
SL8	To apply the basic methods of analysis and assessment of the state of elements of oil and gas objects by means of technical diagnostics in industrial and laboratory conditions
SL9	To create elements of technological schemes and technical devices of oil and gas

<i>1</i>	<i>2</i>
	production, transportation and storage systems
SL10	Understand the general principles of choosing the means of control and automation of technological processes in the oil and gas industry
SL11	Analyze the operating modes of the components of an oil and gas facility, make the optimal choice of technological equipment, optimize the operating mode by a certain criterion
SL12	Evaluate the efficiency of the use of basic oil and gas technologies and technical devices using technical and economic criteria
SL13	Plan and organize the work of the structural unit of the oil and gas enterprise in accordance with the requirements of life safety, labor protection and environmental protection
SL14	Assess the gas content of methane-coal deposits and create systems and technologies for their development

5 SELECTIVE CONTENT OF PREPARATION FORMED IN TERMS OF TRAINING RESULTS

5.1 Academic Bloc 1 «Construction of oil and gas wells»

Code comp.	Code LO	Learning outcomes
<i>1</i>	<i>2</i>	<i>3</i>
SC1.1	CC1.1	To create drilling technologies for oil and gas wells
SC1.2	CC1.2	To construct oil and gas wells
SC1.3	CC1.3	Calculate optimal drilling modes for oil and gas wells
SC1.4	CC1.4	To use in practice methods of diagnostics of level of efficiency of the equipment for drilling of oil and gas wells
SC1.5	CC1.5	Ensure the safety of drilling operations in accordance with the operating rules
SC1.6	CC1.6	Assess and restore quality indicators for the process of oil and gas wells
SC1.7	CC1.7	Provide regulatory and technical support for the processes of oil and gas wells construction
SC1.8	CC1.8	Organize work on the construction of oil and gas wells under conditions of high productivity, safety and minimum costs
SC1.9	CC1.9	To control the construction of oil and gas wells using modern methods of analysis and information processing
SC1.10	CC1.10	To plan components of technological and organizational activity and to manage the construction of oil and gas wells
SC1.11	CC1.11	To monitor the organizational activity, efficiency, perfection and prospects of construction of oil and gas wells
SC1.12	CC1.12	To improve technologies of oil and gas well construction and organizational activity in accordance with the requirements of modern production and competitive economy

5.2 Academic Bloc 2 «Transportation and storage of hydrocarbon energy carriers»

Code comp.	Code LO	Learning outcomes
<i>1</i>	<i>2</i>	<i>3</i>
SC2.1	CC2.1	To create elements of technologies of production, transportation and storage of hydrocarbon energy carriers
SC2.2	CC2.2	Determine operational parameters and design links of technological diagrams

<i>1</i>	<i>2</i>	<i>3</i>
		of coal mine transportation for specific mining and mining-geological conditions
SC2.3	CC2.3	Calculate and adjust operating modes of gas and oil supply systems for different operating conditions
SC3.4	CC3.4	To use in practice methods of diagnostics of level of efficiency of gas-oil supply systems
SC2.5	CC2.5	Ensure the safety of components of gas-oil supply systems in accordance with the operating rules
SC2.6	CC2.6	Evaluate the quality indicators and restore the properties of the elements of gas-oil supply systems for specific operating conditions
SC2.7	CC2.7	Provide regulatory and technical support for the processes of creation, operation and recovery of hydrocarbon transportation and storage systems and technologies
SC2.8	CC2.8	Organize work, ensure proper throughput and safe operation of the links of gas and oil supply systems
SC2.9	CC2.9	To control the functioning of gas and oil supply systems using modern methods of analysis and information processing
SC2.10	CC2.10	To plan components of technological and organizational activity and management of gas-oil supply systems
SC2.11	CC2.11	Monitor the organizational activity, efficiency, perfection and prospects of gas and oil supply systems
SC2.12	CC2.12	To improve the technologies of production, transportation and storage of hydrocarbon energy and organizational activity in accordance with the requirements of modern production and competitive economy

6 DISTRIBUTION OF EDUCATION RESULTS BY EDUCATIONAL COMPONENTS

Code LO	Learning outcomes	Name of educational components
<i>1</i>	<i>2</i>	<i>3</i>
1 REGULATORY PART		
CL1	Demonstrate the ability to think abstractly, perform analysis in the development of technological and computational diagrams of elements of technical systems of production, drilling, transportation and storage of oil and gas.	Introduction to specialty; Fundamentals of oil and gas business Valuable competencies of a specialist Oil and gas extraction technologies
CL2	Demonstrate knowledge of the current state and deep understanding of the role of the oil and gas industry, professional activity in ensuring energy security of Ukraine.	Introduction to specialty; Fundamentals of oil and gas business
CL3	Demonstrate knowledge of technical terminology, the ability to logically express their thoughts in the official language, both orally and in writing.	Ukrainian for foreign students
CL4	Demonstrate ability to communicate in a foreign language, including basic knowledge of special terminology and skills in working with foreign technical publications.	Ukrainian for foreign students

<i>1</i>	<i>2</i>	<i>3</i>
CL5	Demonstrate skills in the use of information and communication technologies to solve a specific engineering problem related to the implementation of basic oil and gas technologies for the extraction, drilling, transportation and storage of oil and gas.	Introduction to specialty Informatics, algorithmization and programming
CL6	Demonstrate the ability to independently acquire new knowledge using technical literature on paper and electronic media.	Valuable competencies of a specialist; Execution of qualification work
CL7	Demonstrate teamwork skills in the course of laboratory work, development of complex course projects, preparation of presentations and more.	Valuable competencies of a specialist; Course project on oil and gas drilling; Introductory, Training Industrial Training, Pre-Diploma Practical
CL8	Demonstrate the ability to safely operate at oil and gas facilities.	Civil Security; Labor protection in the oil and gas industry
CL9	To realize their rights and obligations as a member of society, to realize the values of civil (free democratic) society and the need for its sustainable development, the rule of law, rights and freedoms of man and citizen in Ukraine	Civilization processes in Ukrainian Society; Science of Law
CL10	To preserve and increase moral, cultural, scientific values and achievements of the society on the basis of understanding of history and patterns of development of the subject area, its place in the general system of knowledge about the nature and society and in the development of society, technology and technology, to use different types and forms of motor activity for active relaxing and leading a healthy lifestyle	Civilization processes in Ukrainian Society; Axiological Competences of an Expert
SL1	To characterize geological processes and basic patterns of rock formation, including oil and gas deposits	Geology; Geology Basics of Oil and Gas Deposits; Geodesy; Educational practice (geological) Educational practice (geodetic)
SL2	Explain the general structure, interconnection and functional purpose of individual elements of Ukraine's hydrocarbon energy supply system	Introduction to specialty; Fundamentals of oil and gas business; Transportation systems and technologies; Basics of hydrocarbon transportation and storage Introductory, Training Industrial Training, Pre-Diploma Practical
SL3	Use basic concepts, basic laws of physics and chemistry to predict and analyze the physicochemical properties of oil, condensate and natural gas in the process of their extraction, drilling,	Physics 1; Chemistry; Transportation systems and technologies;; Basics of hydrocarbon

<i>1</i>	<i>2</i>	<i>3</i>
	transportation and storage	transportation and storage
SL4	Perform calculations of the parameters of hydro-gas dynamic processes that accompany the movement of oil and gas in reservoirs / wells / industrial and main pipelines, taking into account the basic laws of thermodynamics, hydraulics and gas dynamics	Hydraulics; Thermodynamics and Heat Transfer; Oil and Gas Mechanics Hydroemechanics in Drilling
SL5	Apply mathematical methods for determining the specific values of technological parameters of oil and gas wells, oil and gas preparation systems, industrial and main gas pipelines, gas storage facilities, other elements of the gas supply system	Mathematics 1; Physics 11; Informatics, algorithmization and programming; Details of machines and mechanisms; Technical mechanics and resistance of materials
SL6	To apply modern software for design and operational calculations of parameters of technological processes of production, drilling of wells, transportation and storage of oil and gas	Engineering graphics; Informatics, algorithmization and programming
SL7	To analyze the technical condition of the elements of technological equipment of the systems of production, transportation and storage of oil and gas using methods based on the basics of materials science and machine mechanics	Materials Science; Details of machines and mechanisms; Rock Mechanics; Oil and Gas Mechanics
SL8	To apply the basic methods of analysis and assessment of the state of elements of oil and gas objects by means of technical diagnostics in industrial and laboratory conditions	Oil and Gas Equipment; Technical mechanics and resistance of materials Metrology, Standardization and Certification; Metrology, Standardization and Certification in the oil and gas complex
SL9	To create elements of technological schemes and technical devices of oil and gas production, transportation and storage systems	Fundamentals of oil and gas business; Rock Mechanics; Oil and Gas Equipment Well drilling; Well drilling (for oil and gas); Term Project in Oil and Gas Drilling; Marine Oil and Gas Technology; Basics of hydrocarbon transportation and storage; Construction and protection of gas pipelines; Oil and gas extraction technologies; Economics and Production Management; Labor protection in the oil and gas industry;

1	2	3
		Execution of qualification work
SL10	Understand the general principles of choosing the means of control and automation of technological processes in the oil and gas industry	Electrical engineering and power supply; Automation of Technological Processes in the Oil and Gas Industry
SL11	Analyze the operating modes of the components of an oil and gas facility, make the optimum choice of technological equipment, optimize the operating mode by a certain criterion.	Well drilling (for oil and gas); Term Project in Oil and Gas Drilling; Marine Oil and Gas Technology; Fundamentals of Transportation and Storage of Hydrocarbons; Oil and gas extraction technologies Execution of qualification work
SL12	Evaluate the efficiency of the use of basic oil and gas technologies and technical devices using technical and economic criteria	Economics and Production Management Execution of qualification work
SL 13	Plan and organize the work of the structural unit of the oil and gas enterprise in accordance with the requirements of life safety, labor protection and environmental protection	Economics and Production Management; Civil Security; Labor protection in the oil and gas industry; Technoecology
SL 14	Assess the gas content of methane-coal deposits and create systems and technologies for their development	Assessment of gas content of methane-coal deposits Technologies for the development of coal fields; Processes of drilling of degassing wells; Execution of qualification work
2 SELECTIVE PART		
2.1	Academic Bloc 1 Construction of oil and gas wells	
CC1.1	To create drilling technologies for oil and gas wells	Drilling of technical wells; Drilling of Inclined-Oriented Wells; Deep Drilling Technology; Water-Well Drilling; Non-traditional hydrocarbon production technologies; Environmental and Resource-Saving Technologies; Execution of qualification work
CC1.2	To construct oil and gas wells	
CC1.3	Calculate optimal drilling modes for oil and gas wells	Hydromechanics in Drilling; Computer Technologies in Drilling; Drilling of Inclined-Oriented Wells; Drilling in Geological Engineering Wells; Drilling Tampon Mixes;

<i>1</i>	<i>2</i>	<i>3</i>
		Drilling Fluids; Completion of Boreholes
CC1.4	To use in practice methods of diagnostics of level of efficiency of the equipment for drilling of oil and gas wells	Hydromechanics in Drilling; Automation of Technological Processes in the Oil and Gas Industry;
CC1.5	Ensure the safety of drilling operations in accordance with the operating rules	Computer Technologies in Drilling;
CC1.6	Assess and restore quality indicators for the process of oil and gas wells	Drilling of Inclined-Oriented Wells; Drilling in Geological Engineering Wells; Drilling Tampon Mixes; Drilling Fluids; Completion of Boreholes; Execution of qualification work
CC1.7	Provide regulatory and technical support for the processes of oil and gas wells construction	Drilling equipment operation; Metrology, Standardization and Certification in the oil and gas complex
CC1.8	Organize work on the construction of oil and gas wells under conditions of high productivity, safety and minimum costs	
CC1.9	To control the construction of oil and gas wells using modern methods of analysis and information processing	Computer Technologies in Drilling
CC1.10	To plan components of technological and organizational activity and to manage the construction of oil and gas wells	Drilling equipment operation
CC1.11	To monitor the organizational activity, efficiency, perfection and prospects of construction of oil and gas wells	Fundamentals of patent; Industrial Practical Training; Pre-certification practice;
CC1.12	To improve technologies of oil and gas well construction and organizational activity in accordance with the requirements of modern production and competitive economy	Execution of qualification work
2.2	Academic Bloc 2 Transportation and storage of hydrocarbon energy	
CC2.1	To create elements of technology of production, transportation and storage of hydrocarbon energy carriers	Occupational Hygiene and Industrial Sanitation; Technologies for the development of coal fields; Urban Gas Supply Systems; The Processes of Underground Storage of Hydrocarbons; Processes of drilling of degassing wells; Oil and Gas Storage Facilities; Execution of qualification work
CC2.2	Determine operational parameters and design links of technological diagrams of coal mine transportation for specific mining and mining-geological conditions	Transportation systems of mining enterprises; Execution of qualification work
CC2.3	Calculate and adjust operating modes of gas and oil	Operation of Gas-Oil Supply

<i>1</i>	<i>2</i>	<i>3</i>
	supply systems for different operating conditions	Systems;
CC2.4	To use in practice methods of diagnostics of level of efficiency of gas-oil supply systems	Pipeline Transportation; Automobile Gas-Filling
CC2.5	Ensure the safety of components of gas-oil supply systems in accordance with the operating rules	Compressor Stations; Modeling of Technological
CC2.6	Evaluate the quality indicators and restore the properties of the elements of gas-oil supply systems for specific operating conditions	Processes; Urban Gas Supply Systems; Oil and Gas Storage Facilities; The Processes of Underground Storage of Hydrocarbons; Industrial Transport; Metrology, Standardization and Certification; Fundamentals of transportation systems diagnostics Industrial Practical Training; Pre-certification practice
CC2.7	Carry out regulatory and technical support for the processes of creation, operation and renewal of systems and technologies of production of hydrocarbon energy carriers	Engineering Logistics; Modeling of Technological Processes; Fundamentals of transportation systems diagnostics The Processes of Underground Storage of Hydrocarbons
CC2.8	Organize work, ensure proper throughput and safe operation of the links of gas and oil supply systems	Engineering Logistics; Urban Gas Supply Systems;
CC2.9	To control the functioning of gas and oil supply systems using modern methods of analysis and information processing	Modeling of Technological Processes; Industrial Transport; Operation of Gas-Oil Supply Systems
CC2.10	To plan components of technological and organizational activity and management of gas-oil supply systems	Engineering Logistics
CC2.11	Monitor the organizational activity, efficiency, perfection and prospects of gas and oil supply systems	Engineering Logistics; Processes of drilling of degassing wells;
CC2.12	Improve technologies for production, transportation and storage of carbohydrate energy and organizational activities in accordance with the requirements of modern production and competitive economy	Technical creativity; Industrial Practical Training; Pre-certification practice; Execution of qualification work

7 DISTRIBUTION OF THE PROGRAM VOLUME BY EDUCATIONAL COMPONENTS

Code	Educational component	Volume, cred.	final control.	Chair, teaching	Distribution by quarters
1	2	3	4	5	6
1	REGULATORY PART	180			
1.1	General training cycle				
G1	Ukrainian for foreign students	15,0	exam	PLC	1;2;3;4; 5;6
G2	Civilization processes in Ukrainian Society	3,0	dc	HPT	1
G3	Valuable competencies of a specialist	6,0	exam	PP	5,6
G4	Science of law	3,0	dc	CCEL	11
G5	Civil Security	3,0	exam	LPCS	13
1.2	Special training cycle				
1.2.1	<i>Basic disciplines in the field of knowledge</i>				
B1	Mathematics 1	5,0	exam	HM	1;2
B2	Chemistry	5,0	exam	Chemistry	1;2
B3	Physics 1	5,0	exam	Physics	3;4
B4	Engineering graphics	3,0	exam	FDMM	1;2
B5	Geology	2,0	exam	GSG	1
B6	Geology	2,0	exam	H&EG	2
B7	Informatics, algorithmization and programming	3,0	dc	CSS	1;2
1.2.2	<i>Specialties in the specialty</i>				
S1	Introduction to specialty	3,0	dc	MPT	1;2
S2	Fundamentals of oil and gas business	5,0	dc	TST	3;4
S3	Geology Basics of Oil and Gas Deposits	3,0	dc	GEMD	3
S4	Geodesy	3,0	dc	Geod	4
S5	Oil and gas mechanics	3,0	dc	MPT	7
S6	Hydraulics	4,0	dc	MM	7;8
S7	Thermodynamics and heat transfer	4,0	exam	MM	5;6
S8	Rock Mechanics	3,0	dc	MPT	6
S9	Materials Science	3,0	dc	MPT	8
S10	Well drilling	3,0	dc	MPT	5
S11	Electrical engineering and power supply	4,0	dc	CEП	5;6
S12	Economics and Production Management	4,0	dc	AE&E	13,14
S13	Fundamentals of transportation and storage of hydrocarbons	8,0	exam	TST	9;10; 11;12
S14	Well drilling (for oil and gas);	4,5	exam	MPT	11;12
S15	Construction and protection of gas pipelines	2,0	exam	TCT	9
S16	Construction and protection of gas pipelines	2,0	exam	ED	10
S17	Oil and Gas Equipment	4,0	dc	MPT	7;8
S18	Term Project in Oil and Gas Drilling	0,5	dc	MPT	12
S19	Labor protection in the oil and gas industry	4,0	exam	LPCS	15

1	2	3	4	5	6
S20	Transportation systems and technologies	4,0	dc	TST	5;6
S21	Technoecology	4,0	exam	Ecol	7;8
S22	Assessment of gas content of methane-coal deposits	4,0	dc	TST	15
S23	Oil and gas extraction technologies	2,0	exam	TST	13
S24	Oil and gas extraction technologies	2,0	exam	MPT	14
S25	Technical mechanics and resistance of materials	5,0	exam	STAM	5;6
S26	Details of machines and mechanisms	4,0	exam	FDMM	7;8
S27	Offshore Oil and Gas Technology	3,0	dc	MPT	15
1.2.3	<i>Practical training and certification in the specialty</i>				
P1	Educational practice (geological)	3,0	dc	GEMD	4
P2	Educational practice (geodetic)	3,0	dc	Geod	4
P3	Educational Introductory Practical Training	6,0	dc	MPT	8
P4	Industrial Practical Training	6,0	dc	MPT	12
P5	Pre-certification practice	3,0	dc	MPT	16
P6	Execution of qualification work	4,0	dc	TPPKK	16
P7	Execution of qualification work	4,0	dc	TST	16
P8	Execution of qualification work	1,0	dc	LPCS	16
2	SELECTIVE PART	60			
2.1	Bloc 1 Construction of oil and gas wells				
S1.1	Metrology, standardization and certification in the oil and gas complex	3,0	dc	MPT	9;10
S1.2	Non-traditional hydrocarbon production technologies	4,0	exam	TST	9;10
S1.3	Water-Well Drilling	4,0	exam	MPT	9;10
S1.4	Drilling in Geological Engineering	3,0	dc	MPT	9;10
S1.5	Fundamentals of the patent case	3,0	dc	MPT	10
S1.6	Automation of Technological Processes in the Oil and Gas Industry	4,0	dc	MPT	11;12
S1.7	Hydroemechanics in Drilling	5,0	exam	MPT	11;12
S1.8	Drilling Fluids	4,0	dc	MPT	11
S1.9	Computer Technologies in Drilling	4,0	dc	MPT	11;12
S1.10	Deep drilling technology	4,0	exam	MPT	15
S1.11	Drilling of Inclined-Oriented Wells	4,0	dc	MPT	13;14
S1.12	Drilling equipment operation	4,0	dc	MPT	13;14
S1.13	Drilling Tampon Mixes	4,0	dc	MPT	15
S1.14	Drilling of technical wells	3,0	dc	MPT	13;14
S1.15	Completion of Boreholes	3,0	dc	MPT	15
S1.16	Environmental and Resource-Saving Technologies	4,0	exam	Ecol.	13;14
2.2	Bloc 2 Transportation and storage of hydrocarbon energy				
S2.1	Metrology, Standardization and Certification	3,0	dc	TST	9,10
S2.2	Processes of drilling of degassing wells	4,0	exam	MPT	9;10
S2.3	Occupational Hygiene and Industrial Sanitation	4,0	exam	LPCS	9;10
S2.4	Industrial Transport	3,0	dc	TST	9;10
S2.5	Technical creativity	3,0	dc	TST	10
S2.6	Technologies for the development of coal fields	5,0	dc	TST	11;12
S2.7	Pipeline transportation	4,0	exam	TST	11,12
S2.8	Modeling of Technological Processes	4,0	dc	TST	11;12
S2.9	Urban Gas Supply Systems	4,0	dc	TST	11;12

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
S2.10	Operation of Gas-Oil Supply Systems	4,0	dc	TST	13;14
S2.11	Oil and gas storage facilities	4,0	exam	TST	15
S2.12	Engineering Logistics	4,0	dc	TST	13;14
S2.13	Automobile Gas-Filling Compressor Stations	3,0	dc	TST	15
S2.14	Transportation systems of mining enterprises	3,0	dc	TST	13;14
S2.15	The Processes of Underground Storage of Hydrocarbons	4,0	dc	TST	15
S2.16	Fundamentals of transportation systems diagnostics	4,0	exam	Ecol.	13;14
	Together for the regulatory part and the selective block	240			

Note: Indication of the departments entrusted with teaching the disciplines: AE&E – applied economics and entrepreneurship; STAM – construction, theoretical and applied mechanics; HM – higher mathematics; H&EG – hydrogeology and engineering geology; Geod – geodesy; GEMD – geology and exploration of mineral deposits; MM – mining mechanics; GSG - general and structural geology; Ecol. – ecology; ED – electric drive; ForL – foreign languages; HPT – history and political theory; PES – physical education and sports; MIMT – metrology and information and measurement technologies; FDMM – fundamentals of designing mechanisms and machines; LPCS – labor protection and civil security; CSS – computer systems software; AE – applied economy; MEE – mining engineering and education; PSS – power supply systems; MPT – mineral prospecting technology; TST – transport systems and technologies; PLC – philology and language communication PP – philosophy and pedagogy; CCEL – civil, commercial and environmental law

8 STRUCTURAL-LOGICAL DIAGRAM

8.1 Educational Components of the Regulatory Part and Selection Block 1 «Oil and Gas Well Construction»

<i>course</i>	<i>semester</i>	<i>quarter</i>	Codes of educational components	Annual volume, loans	Number of educational components taught throughout		
					quarters	semester	Educational year
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>
1	1	1	G1, G2, B1, B2, B4, B5, B7, S1	60	8	9	15
		2	G1, B1, B2, B4, B6, B7, S1		7		
	2	3	G1, B3, S2, S3		4	7	
		4	G1, B3, S2, S4, P1, P2		6		
2	3	5	G1, G3, S7, S25, S10, S11, S17	60	7	8	15
		6	G1, G3, S7, S25, S8, S11, S17		7		
	4	7	S6, S26, S5, S9, S20, S21		6	7	
		8	S6, S26, S20, S21, P3		5		
3	5	9	S13, S15, S1.1, S1.2, S1.3, S1.4	60	6	8	16
		10	S13, S16, S1.1, S1.2, S1.3, S1.4, S1.5		7		
	6	11	G4, S13, S14, S1.6, S1.7, S1.8, S1.9		7	8	
		12	S13, S14, S18, S1.6, S1.7, S1.8, S1.9, P4		8		
4	7	13	G5, S12, S23, S1.11, S1.12, S1.14, S1.16	60	7	7	15

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>
		14	S12, S24, S1.11, S1.12, S1.14, S1.16		6		
	8	15	S19, S22, S27, S1.10, S1.13, S1.15		6	8	
		16	P5, P6, P7, P8		4		

8.2 Educational Components of the Regulatory Part and Selection Block 2
«Transportation and storage of hydrocarbon energy carriers»

course	semester	quarter	Codes of educational components	Annual volume, loans	Number of educational components taught throughout		
					quarters	semester	Educational year
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>
1	1	1	G1, G2, B1, B2, B4, B5, B7, S1	60	8	9	15
		2	G1, B1, B2, B4, B6, B7, S1		7		
	2	3	G1, B3, S2, S3		4	7	
		4	G1, B3, S2, S4, P1, P2		6		
2	3	5	G1, G3, S7, S25, S10, S11, S17	60	7	8	15
		6	G1, G3, S7, S25, S8, S11, S17		7		
	4	7	S6, S26, S5, S9, S20, S21		6	7	
		8	S6, S26, S20, S21, P3		5		
3	5	9	S13, S15, S2.1, S2.2, S2.3, S2.4	60	6	8	16
		10	S13, S16, S2.1, S2.2, S2.3, S2.4, S2.5		7		
	6	11	G4, S13, S14, S2.6, S2.7, S2.8, S2.9		7	8	
		12	S13, S14, S18, S2.6, S2.7, S2.8, S2.9, P4		8		
4	7	13	G5, S12, S23, S2.10, S2.12, S2.14, S2.16	60	7	7	15
		14	S12, S24, S2.10, S2.12, S2.14, S2.16		6		
	8	15	S19, S22, S27, S2.11, S2.13, S2.15		6	8	
		16	P5, P6, P7, P8		4		

9 FINAL PROVISIONS

The program is designed taking into account normative and guidance materials of international, sectoral and national levels:

1 User Guide ЄKTC [Electronic resource]. URL: http://mdu.in.ua/Ucheb/dovidnik_koristuvacha_ekts.pdf (date of appeal: 19.04.2018).

2 Law of Ukraine “On Higher Education” [Electronic resource]. URL: <https://zakon.rada.gov.ua/laws/show/1556-18> (date of appeal: 19.04.2018).

3 Law of Ukraine “On Education” [Electronic resource]. URL: <https://zakon.rada.gov.ua/laws/show/2145-19> (date of appeal: 19.04.2018).

4 Letter from the Ministry of Education and Science of Ukraine from 28.04.2017 № 1/9–239 on the use of exemplary educational programs in higher education institutions.

5 Order of the Ministry of Education and Science of Ukraine from 01.06.2017 № 600 in the version of the order of the Ministry of Education and Science of Ukraine from 21.12.2017 № 1648.

6 Draft Higher Education Standard Training Bachelor of Science Degree 185 «Oil and gas engineering and technologies». CBO-2016. – K.: MES Ukraine, 2016. – 15 p.

7 Higher Education Standard of the State Higher Educational Institution "NSU" Designing of the educational process approved by the Academic Council 15.11.2016, protocol № 15.

8 Resolution of the Cabinet of Ministers of Ukraine from 30 December 2015 Y. № 1187 «Licensing conditions for conducting educational activities of educational institutions». <http://zakon5.rada.gov.ua/laws/show/1187-2015-п/page>.

The educational program is published on the University's website prior to the admission of students to study.

The educational program extends to all departments of the University and is put into effect from 1 September 2018 year.

The educational program is subject to revision and revision in accordance with changes in the regulatory framework of Ukraine in the field of higher education.

The responsibility for the implementation of the educational program and the quality assurance of higher education lies with the heads of the graduating departments.

Educational edition

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