MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
NATIONAL TECHNICAL UNIVERSITY
«KHARKIV POLYTECHNIC INSTITUTE»

APPROVED
Rector of NTU "KhPI"
_____ Yevgen SOKOL
«_30_» _____05_____ 2022

EDUCATIONAL PROFESSIONAL PROGRAM
OIL AND GAS PRODUCTION

The second (master's) level

by specialty	**185 Oil and gas engineering and technology**
field of knowledge	**18 Production and technology**
qualification	**Master of Petroleum Engineering and Technology**

APPROVED
ACADEMIC COUNCIL OF NTU "KhPI"
Chairman of the Academic Council
_____ Leonid TOVAZHNYANSKYY
Minutes № 4 from
«_27__» _May__2022

Kharkiv 2022

PREFACE

The educational program for masters in the specialty 185 "Oil and Gas Engineering and Technology" is a normative document that summarizes the content of education, ie reflects the goals of educational and professional training, determines the place of the specialist in the state economy and requirements for his competencies and other socially important properties and qualities.

Introduced by the National Technical University "Kharkiv Polytechnic Institute" and is based on the Law of Ukraine "On Higher Education", the draft standard of higher education of Ukraine in the specialty 185 "Oil and Gas Engineering and Technology", Regulations on accreditation of educational programs (approved by the orders of the Ministry of Education and Science of Ukraine of July 11, 2019 №977).

Head of the working group (guarantor of the educational program):

Biletsky Volodymyr Stefanovych, Doctor of Technical Sciences, Professor of Department of Oil, Gas and Condensate Production.

Members of the working group:

Rymchuk Danylo Vasylyovych, PhD (Technical Sciences), Senior lecturer of Department of Oil, Gas and Condensate Production.

Donsky Dmytro Fedorovych, PhD (Technical Sciences), Associate professor of Department of Oil, Gas and Condensate Production.

Reviews-feedback from external stakeholders:

From the academic community:

1. Sukhov Valery Vasyliovych, PhD, Head of Department of Fundamental and Applied Geology, V.N. Karazin Kharkiv National University.

2. Zezekalo Ivan Gavrylovych, Doctor of Technical Sciences, Professor of the Department of Oil and Gas Engineering and Technologies of Y. Kondratyuk Poltava National Technical University.

3. Galko Tetyana Mykolaivna, Doctor of Geological Sciences, Head of Department of Development of Gas and Gas Condensate Fields at Ukrainian Research Institute of Natural Gases.

From employers:

1. Kryvulya Serhii Viktorovych, PhD, First Deputy Director of GPU Shebelinkagazvydobuvannya.

2. Makhovets Volodymyr Petrovych, director of PJSC Ukrgazvydobutok.

From users of the program:

1. Bakhshiev Fariz Zakir ogli, student of group XT-M622.

LETTER OF APPROVAL
of educational and professional program

Level of higher education	Second (master's)
Field of knowledge	18 Production and technology
Specialty	185 Oil and gas engineering and technology
Qualification	Master of Petroleum Engineering and Technology

DEVELOPED
By working group
Guarantor of the educational program "Oil and Gas Production"

_____ Volodymyr BILETSKY

«16» 05 2022

RECOMMENDED
Methodical council of NTU "KhPI"
Chairman of the methodical council

_____ Yevgen SOKOL

«30» 05 2022

AGREED
Head of the Department of Oil, gas and condensate Production

_____ Illia FYK

«16» 05 2022

AGREED
Director of the Educational and Scientific Institute of Chemical technology and engineering

_____ Igor RISHCHENKO

«17» 05 2022

AGREED

ShebelynkaGasVydobuvannya

Gas Production Division

First vice-director

_____ Serhii KRIVULYA

«__» _____ 2022

Chairman of the student government
student of group I-319 s

_____ Diana BIRIUKOVA

«16» 05 2022

AGREED

PJSC "Ukrgazvydobutok"

Director

_____ Volodymyr MAKHNOVETS

«20» 05 2022

C O N T E N T

1. PROFILE OF THE EDUCATIONAL PROFESSIONAL PROGRAM

Oil and gas production
in the specialty 185 Oil and Gas Engineering and Technology

1 – General information	
Full name of the institution of higher education (IHE) and institute / faculty / department	National Technical University "Kharkiv Polytechnic Institute", Educational and Scientific Institute of Chemical Technologies and Engineering
Degree of higher education and title of qualification in the original language	Master Master of Petroleum Engineering and Technology
Program cycle/level	FQ-EHEA – the first cycle, QF LLL – 6^{th} level, NRK of Ukraine – 7^{th} qualification level
Official name of the educational program	Oil and gas production
Type of diploma and scope of educational program	Single, 90 ECTS credits, term of study 1 year 4 months
Availability of accreditation	primary
Prerequisites	To obtain the second (master's) level of education in the specialty 185 "Oil and Gas Engineering and Technology" can enter persons who have obtained the educational level "Bachelor". Competitive selection of persons entering on the basis of a bachelor's degree in the specialty 185 "Oil and Gas Engineering and Technology" takes into account the results of the certificate of the Ukrainian Center for Quality Assessment of Foreign Language and Professional Entrance Test. For persons who enter on the basis of a higher education degree "bachelor" or master's degree (educational qualification level "specialist"), obtained in another specialty, an additional interview is provided.
Language (s) of teaching	Ukrainian/English
Term of the educational program	According to the validity of the accreditation certificate
Internet address of the permanent placement of the educational program	http://web.kpi.kharkov.ua/dngik/
2 – The purpose of educational program	
Ensuring modern, high-quality training of specialists by forming in higher education students the competencies necessary for the complex solution of complex problems, innovation and scientific-research activities in the petroleum industry.	

3 – Characteristics of the educational program	
Subject area (field of knowledge, specialty, program)	Field of knowledge: 18 Production and technologies Specialty: 185 Oil and gas engineering and technology Educational and professional program: Oil and gas production
Orientation of the educational program	Educational and professional program with applied orientation. The program is focused on training specialists with a broad outlook in the field of oil and gas condensate production capable of working in an international environment. Professional accents: formation of professional knowledge on the basis of modern principles of oil and gas field development, advanced technologies of oil and gas production, as well as practical experience, which includes employment in engineering positions and the possibility of further education and career growth.
The main focus of the educational program and specializations	Higher education in field of knowledge 18 production and technology in the specialty 185 oil and gas engineering and technology and the formation and development of professional competencies in the complex according to the main areas: reservoir engineering, intensification of oil and gas production to increase the ratio of gas and oil condensate recovery and energy efficiency, including at the field development final stage. Key words: oil and gas production, development of oil and gas fields, transportation and storage of oil and gas, technology of well intensification, well operation, well repairing .
Features of the program	Theoretical and experimental research in the design of oil and gas condensate fields using the latest software packages taking into account the experience of field development in Ukraine and the use of non-standard methods (use of cycling process to increase condensate production by preventing its formation in the reservoir, hydraulic fracturing, development of fields with raising of formation pressure before the beginning of operation, methods of development of deposits by flooding, etc.) Theoretical and experimental researches with the use of innovative methods of intensification and modern methods of repair of oil and gas wells (pressure compressor stations, low-temperature gas separation, hydro-sandblasting perforation, snabbing, coltubing and pigguing technologies, extraction of fluids with the use of grouped and horizontal wells)
4 – Suitability of graduates for employment and further study	
Suitability for employment	The graduate may hold the following primary positions in accordance with the "Handbook of qualification characteristics of employees' professions" (DK 003:2010). Oil and natural gas production. Sections: "Oil and natural gas production": 2147.2 engineer for oil and gas production; 2147.2 well test engineer; 2147.2 oil and gas pipeline operation engineer; 2147.2 engineer with reservoir pressure maintenance; 2147.2 engineer for operation of gas facilities equipment; 2147.2 engineer for operation of the linear part of the main gas pipeline; 2147.2 engineer for preparation and transportation of oil

Further study	Opportunity to continue studying at the third (educational and scientific) level to obtain the degree of Doctor of Philosophy. Acquisition of partial qualifications in other specializations in the system of postgraduate education.
5 – Teaching and assessment	
Teaching and learning	Problem-oriented and practically oriented, with adherence to the principles of student-centeredness and individual-personal approach. **Teaching** is carried out through lectures, seminars, practical and laboratory classes, organization of independent work of students, trainings for the development of creative thinking and ability to work in a team, industrial practice and undergraduate practice in scientific-research institutes and facilities of GPU "Shebelynkagazvydobuvannya", research guidance. **Learning** is carried out by attending lectures, seminars, practical and laboratory classes, working with educational and scientific sources in the library, conducting research, practicing skills during internships, creating presentations.
Assessment	**Monitoring** of students' knowledge and skills is carried out in the form of current and final control **Current control** – oral and written survey, work evaluation.
6 – Program competencies	
Integral competence	Ability to solve complex specialized problems and practical problems in professional activities related to the oil and gas industry, or in the learning process, which involves the application of certain theories and methods of oil and gas mechanics and is characterized by complexity and uncertainty.
General competencies (GC)	
GC 1	Ability to abstract thinking, analysis and synthesis.
GC 2	Ability to identify, pose, solve problems.
GC 3	Ability to work in an international context and in a global information environment by profession
GC 4	Ability to generate new ideas (creativity).
GC 5	Ability to develop and manage projects.
GC 6	Understanding the need to comply with copyright and patent law of intellectual property; perception of state and international systems of legal protection of intellectual property
Special (professional) competencies (SC)	
SC 1	Understanding the general structure and relationship of individual elements of the system of supply of Ukraine with hydrocarbons, and ways to improve their energy efficiency.
SC 2	Ability to identify problems, formulate tasks and make informed decisions in professional activities.
SC 3	Ability to perform theoretical and experimental studies of parameters and modes of operation of systems and technologies in petroleum industry.

SC 4	Ability to develop and implement innovations to improve technologies and increase the technical level of systems in petroleum industry.
SC 5	Ability to apply modern methods of mathematical modeling of oil and gas development, advanced technologies for drilling wells, production, transportation and storage of oil and gas.
SC 6	Ability to organize production processes and technical management of systems and technologies in the oil and gas sector of industry.
SC 7	Ability to conduct technological and technical and economic evaluation of the effectiveness of use of advanced oil and gas technologies and the latest technical means.
7 – Learning results (LR)	
The final, total and integrative learning results that determine the normative content of training and correlate with the above list of general and special competencies are given below.	
LR 1	Demonstrate a deep understanding of the role of petroleum industry in ensuring Ukraine's energy security.
LR 2	Analyze geological processes and complex patterns of formation of oil and gas deposits, reliably predict the prospects for hydrocarbon production.
LR 3	Be able to think abstractly, perform system analysis and synthesis in the development of technological and calculation schemes of technical systems for drilling wells, production, transportation and storage of oil and gas.
LR 4	Be able to communicate with specialists and experts of different levels of other fields of knowledge, including in the international context and in the global information environment.
LR 5	Develop and implement innovative products and measures to improve and enhance the technical level of systems and technologies in petroleum industry to ensure their competitiveness.
LR 6	Analyze, evaluate and apply modern software and hardware platforms to solve complex problems of petroleum engineering.
LR 7	Develop project documentation for oil and gas systems and technologies.
LR 8	Be able to apply methods of protection of intellectual property created in the course of professional (scientific and technical) activities.
LR 9	Demonstrate the ability to conduct technological and technical and economic evaluation of the effectiveness of the use of advanced oil and gas technologies and the latest technical means.
LR 10	Organize production processes and technical management of systems and technologies in petroleum industry.
8 – Resource support for program implementation	
Staffing	Meets the personnel requirements for ensuring the implementation of educational activities in the field of higher education for the second (master's) level in accordance with the requirements of Annex 12 to the Licensing Conditions approved by the Cabinet of Ministers of Ukraine dated 30.12.2015 № 1187 as amended by the Cabinet of Ministers of Ukraine dated 24 March 2021 № 365.

Material and technical support	Meets the technological requirements for material and technical support of educational activities in the field of higher education in accordance with current legislation of Ukraine (Resolution of Cabinet of Ministers of Ukraine "On approval of licensing conditions for educational activities of educational institutions" from 30.12.2015 № 1187 as amended, approved by the Resolution of the Cabinet of Ministers of Ukraine of March 24, 2021 № 365).
Information and educational and methodical support	Meets the technological requirements for educational and methodological and informational support of educational activities in the field of higher education in accordance with current legislation of Ukraine (Resolution of the Cabinet of Ministers of Ukraine "On approval of licensing conditions for educational activities of educational institutions" from 30.12.2015 № 1187 of amendments approved by the Resolution of the Cabinet of Ministers of Ukraine of March 24, 2021 № 365).
9 – Academic mobility	
National credit mobility	National credit mobility for the institution of higher education is ensured by cooperation with the leading the institution of higher education of Ukraine in order to organize mutual exchange of students, teachers and administrative staff in accordance with the cooperation agreement. Documents containing provisions on academic mobility: a bilateral cooperation agreement with V.N. Karazin Kharkiv National University (agreement dated 25.12.2020)
International credit mobility	Agreements on international academic mobility (Erasmus+ K1) with universities: Istanbul Technical University (Republic of Turkey) Brandenburg University of Applied Sciences (Germany) Otto von Gerrike Magdeburg University (Germany). Within the framework of adopted agreements, cooperation is carried out in the following areas: cooperation in the recruitment and training of students and graduate students; mutual visits and exchange of staff for research and exchange of teaching experience; visits and exchanges of graduate and undergraduate students for study and research (long-term and short-term programs); mutual visits of the management of educational institutions.
Education of foreign applicants for higher education	Students are taught in English and Ukrainian

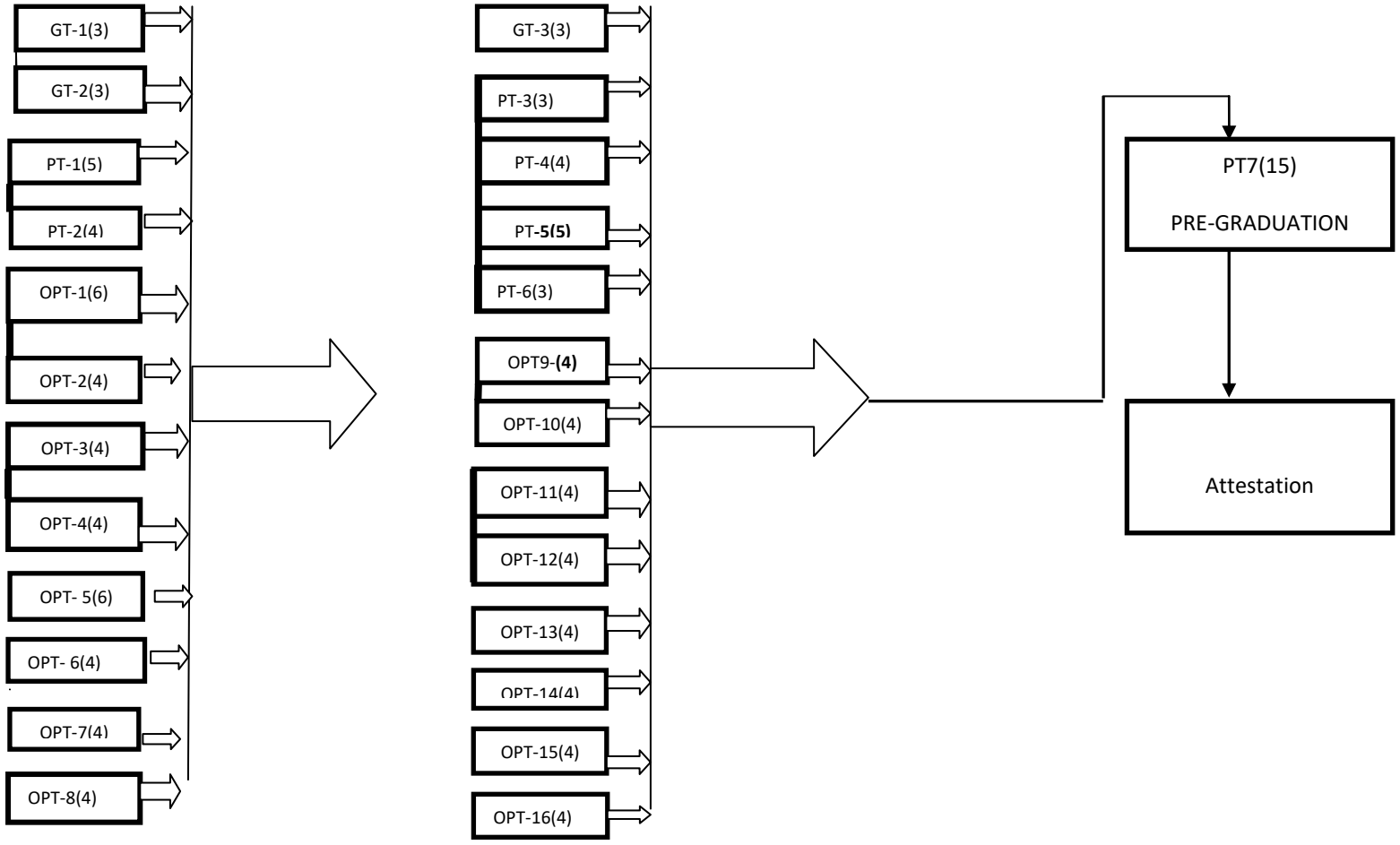
2. LIST OF EDUCATIONAL COMPONENTS OF THE EDUCATIONAL PROFESSIONAL PROGRAM

Oil and gas production in the specialty 185 Oil and Gas Engineering and Technology

Code	Components of the educational program (academic disciplines, course projects/course works, practices, qualification work)	Number of credits	Form of final control
1	2	3	4
1. Obligatory educational components			
1.1 General training			
GT 1	Intellectual Property	3,0	Test (1)
GT 2	International definitions of advanced technologies and terminologies of petroleum industry	3,0	Test (1)
GT 3	Innovative entrepreneurship and management of startup projects	3,0	Test (2)
1.2 Special training			
PT 1	Advanced technologies of reservoir engineering and petroleum fields operation	5,0	Exam (1)
PT 2	Practical use of software in reservoir engineering and petroleum fields operation	4,0	Exam (1)
PT 3	Interpretation of geophysical researches of oil and gas wells	3,0	Test (1)
PT 4	Innovative methods of intensification of oil and gas wells	6,0	Exam (2)
PT 5	Advanced technologies of oil and gas production	6,0	Exam (2)
PT 6	Methodology of scientific research	3,0	Test (2)
PT 7	Pre-graduation practice	15,0	Test (3)
PT 8	Attestation	15,0	(3)
2. Optional Profile training discipline			
OPT 1	Unconventional methods in reservoir engineering and petroleum fields operation	4,0	Exam (1)
OPT 2	Fountain fitting and gas safety in petroleum industry	4,0	Exam (1)
OPT 3	Automation of processes in petroleum industry	4,0	Exam (1)
OPT 4	Fundamentals of professional psychology	4,0	Exam (1)
OPT 5	Environmental safety in petroleum industry	4,0	Exam (1)
OPT 6	Materials, chemical reagents and process fluids in oil and gas production	4,0	Exam (1)

1	2	3	4
OPT 7	Advanced technologies of oil and gas wells drilling engineering	4,0	Exam (1)
OPT 8	Ensuring the operation of petroleum industry and restoration of its elements in emergency conditions	4,0	Exam (1)
OPT9	Modern technologies of offshore oil and gas production	4,0	Exam (2)
OPT 10	Petroleum field geology and interpretation of geophysical researches	4,0	Exam (2)
OPT 11	Advanced technologies for hydrocarbon transportation and storage	4,0	Exam (2)
OPT 12	Psychology of leadership	4,0	Exam (2)
OPT13	Metrology, standardization and conformity assessment	4,0	Exam (2)
OPT14	Advanced technologies for oil and gas collection and preparation	4,0	Exam (2)
OPT15	Modern methods of oil and gas wells repairing	4,0	Exam (2)
OPT16	Well completion and well operation	4,0	Exam (2)
OPT17	Legal provision of environmental safety in petroleum industry	4,0	Exam (2)
The total volume of the general training cycle:		**9,0**	
The total volume of the special training cycle:		**57,0**	
Total amount of **obligatory educational components**:		**66,0**	
Total amount of **optional educational components:**		**24,0**	
TOTAL AMOUNT OF THE EDUCATIONAL PROGRAM		**90,0**	

3. STRUCTURAL AND LOGICAL SCHEME OF THE EDUCATIONAL PROFESSIONAL PROGRAM
Oil and gas production
in specialty 185 Oil and Gas Engineering and Technology



4. HIGHER EDUCATION CERTIFICATION FORM

Graduation certification of applicants for higher education in the educational program of 185 Oil and Gas Engineering and Technology is conducted in the form of defense of the qualification work and ends with the issuance of a document (diploma) of the established **master's degree in oil and gas engineering and technology**.

Graduation certification is open and public.

Requirements to qualifying work	Qualification work should include an independent research component, solving a complex specialized problem or an actual scientific and technical problem in the petroleum industry, characterized by complexity and uncertainty of conditions, using theories and methods of petroleum engineering. **The scope and structure of work is set by the institution of higher education.** Qualification work should be checked for plagiarism in accordance with the procedure defined by the system of ensuring the quality of educational activities and the quality of higher education by the institution of higher education. Qualification work must be posted on the official website of the higher education institution or its structural unit, or in the repository of the higher education institution.

3. MATRIX OF COMPLIANCE OF PROGRAM COMPETENCIES WITH THE EDUCATIONAL COMPONENTS OF THE EDUCATIONAL PROFESSIONAL PROGRAM

Oil and gas production
in specialty 185 Oil and Gas Engineering and Technology

	GT 1	GT 2	GT 3	PT 1	PT 2	PT 3	PT 4	PT 5	PT 6	PT 7	PT 8	OP T1	OPT2	OP T3	OP T4	OP T5	OP T6	OP T7	OP T8	OPT 9	OPT 10	OPT 11	OPT 12	OPT 13	OPT 14	OPT 15	OPT 16
GC 1			+						+	+	+																
GC 2			+						+	+	+				+			+								+	
GC 3	+	+								+	+																
GC 4	+								+	+	+												+				
GC 5			+							+	+												+				
GC 6	+	+								+	+																
SC 1				+	+	+	+	+		+	+	+	+	+				+		+				+	+		
SC 2				+	+		+		+	+	+				+		+			+	+					+	+
SC 3						+		+	+	+	+					+	+	+	+					+			
SC 4				+	+					+	+	+	+	+				+		+	+	+					+
SC 5							+	+		+	+	+	+			+	+							+	+	+	
SC 6				+		+	+			+	+	+	+	+	+				+	+	+	+	+		+		+
SC 7			+	+	+					+	+								+						+		

4. MATRIX OF PROVIDING PROGRAM LEARNING RESULTS BY RELEVANT EDUCATIONAL COMPONENTS OF THE EDUCATIONAL PROFESSIONAL PROGRAM

Oil and gas production

in specialty 185 Oil and Gas Engineering and Technology

	GT 1	GT 2	GT 3	PT 1	PT 2	PT 3	PT 4	PT 5	PT 6	PT 7	PT 8	OP T1	OPT2	OP T3	OP T4	OP T5	OP T6	OP T7	OP T8	OPT 9	OPT 10	OPT 11	OPT 12	OPT 13	OPT 14	OPT 15	OPT 16
LR 1				+				+		+	+	+	+	+		+		+		+	+			+			
LR 2								+		+	+						+		+								
LR 3									+	+	+	+	+				+			+	+			+		+	
LR 4		+		+		+				+	+				+								+				
LR 5	+	+	+	+			+		+	+	+					+		+	+		+	+					+
LR 6								+		+	+	+				+	+		+								
LR 7	+			+	+	+	+	+		+	+		+	+			+	+		+	+			+	+	+	+
LR 8	+									+	+																
LR 9			+		+		+		+	+	+							+							+		
LR 10			+		+		+			+	+		+	+	+				+		+	+	+	+	+		+