Federal State Autonomous Educational Institution of Higher Education
Peoples' Friendship University of Russia named after Patrice Lumumba
RUDN University
Academy of Engineering

educational division (faculty/institute/academy) as higher education programme developer

INTERNSHIP SYLLABUS

Pre-graduation Practical Training / Преддипломная практика

internship title

Industrial

internship type

Recommended by the Didactic Council for the Education Field of:

21.04.01 Oil and Gas Engineering

field of studies / speciality code and title

The student's internship is implemented within the professional education programme of higher education:

Oil and Gas Engineering / Технологии добычи и транспортировки нефти и газа

higher education programme profile/specialisation title

2026

1. INTERNSHIP GOAL(s)

The goal of the Internship «Pre-graduation Practical Training / Преддипломная практика» is the implementation of scientific research necessary for the development of the final qualifying work; the formation and development of practical skills and competencies of a master, the acquisition of experience in independent professional activity; consolidation and deepening of the received theoretical knowledge in the studied disciplines; the formation of masters' skills in applying the knowledge obtained during training in independent professional activities.

The main tasks of «Pre-graduation Practical Training / Преддипломная практика» are:

- collection of materials for writing a master's thesis;
- study of specific methods and techniques for the activities of oil and gas enterprises;
- study of modern technologies for solving various problems of production, pipeline transport and processing of hydrocarbons in real conditions;
- preparation of analytical materials, information reviews on the development of modern technologies for the production, pipeline transport and processing of hydrocarbons;
- development of the ability to conduct independent research in accordance with the developed program;
- collection of information necessary for the preparation of the practical part of the master's thesis, acquisition of skills for their processing and analysis;
- acquisition and synthesis of data confirming the conclusions and main provisions of the master's thesis, testing its most important results and proposals.

2. REQUIREMENTS FOR LEARNING OUTCOMES

The internship «Pre-graduation Practical Training / Преддипломная практика» is aimed at the development of the following competences (competences in part):

Table 2.1. List of competences that students acquire during the internship

Competence code	**Competence descriptor**	**Competence formation indicators** (within this course)
GC-1	Able to search, critical make a critical analysis of problem situations based on a systematic approach, develop an action strategy.	GC-1.1. Knows the methods of critical analysis and evaluation of modern scientific achievements; methods of critical analysis; basic principles of critical analysis. GC-1.2. Can analyze the task, highlighting its basic components, decompose the task; receive new knowledge based on analysis, synthesis, etc.; carry out a critical analyze of information necessary to solve the problem; collect data on complex scientific problems related to the professional field; search for information and solutions based on actions, experiment and experience. GC-1.3. Has the ability to study the problem of professional activity using analysis; synthesis and other methods of intellectual activity; identify scientific problems and use adequate methods to solve them; the skills of value judgments in solving professional situations.
GC-6	Able to identify and implement the priorities of their own activities and ways to improve them based on self-assessment.	GC-6.1. Knows their resources and their limits (personal, situational, temporary, etc.), for the successful completion of the assigned work; the basics of planning the long-term goals of their own activities, taking into account the conditions, means,

		personal opportunities, stages of career growth, the time perspective for the activity development and the requirements of the labor market. GC-6.2. Can realize the intended goals of the activity, taking into account the conditions, means, personal capabilities, stages of career growth, time perspective for the development of activities and the requirements of the labor market; critically assess the efficiency of using time and other resources in solving the tasks, as well as regarding the result obtained. GC-6.3. Has the skills to determine an effective course of action in the field of professional activity; making decisions at the level of one's own professional activity; the skills in planning their own professional activities.
PC-1	Able to use theoretical knowledge when performing technological scientific research in the field of development, transportation and processing of oil and gas	PC-1.1 Knows fundamental concepts in the field of geology of oil and gas fields, methods of forecasting, prospecting and exploration of mineral deposits; regulatory and methodological documents in the field of hydrocarbon production and development of oil and gas fields PC-1.2 Can use theoretical knowledge and mining and geological information to carry out technological scientific research, as well as apply knowledge of regulatory and methodological documents to assess oil and gas fields PC-1.3 Has the theoretical knowledge, methods of subsurface research in the field of oil and gas field development; skills to perform production, technological and engineering research in the field of hydrocarbon production, development of oil and gas fields
PC-2	Able to develop and implement new advanced technologies in the field of geological exploration, evaluation and estimation of hydrocarbon raw materials	PC-2.1 Knows the methodological provisions, instructions and requirements for the geological study of the subsoil and geological exploration; the reserve estimation management policy; rules for compiling documentation in the field of reserves estimation and management; technologies for conducting, processing and interpreting geological and geophysical works; exploration technologies; national and global trends in the development of advanced technologies PC-2.2 Can manage the production activities of the entrusted structural unit; check the design documentation for compliance with the requirements of existing norms and rules; introduce advanced technologies in the process of prospecting and exploration of oil and gas fields; develop proposals and take prompt measures aimed at improving the quality of activities work PC-2.3 Has the skillsfor studying Russian and foreign experience in matters of assessing and managing reserves; skills forpreparing proposals for new methods and technologies in the field of geological exploration and reserve estimation; the skills for supervising the execution of case studies and research and development activities
PC-3	Able to manage the system for monitoring the technical condition and technical diagnostics at the facilities and plants of the oil and gas complex	PC-3.1 Knows the principles, physical foundations, technical support of technical control and diagnostic methods, modern developments in the field of strength of materials, fracture mechanics, materials technology and materials science; design features, manufacturing technology, operation and repair of the control object, types and types of defects, probable zones of their formation, taking into account the loads acting on the object and other factors, principles, physical foundations, technical support

		for the types and methods of technical control and diagnostics; principles of construction, functional diagrams and rules for operating equipment for a given method of control, rules for selecting and checking the quality of used consumable flaw detection materials; control systems used to check objects (products) of a certain type; metrological support; standards, calculation methods and other applicable regulatory documents and rules for assessing the technical condition; harmful environmental factors of this control method and ways to prevent their impact on the environment and humans; principles of planning and organization of work of technical control and diagnostic units, current state and prospects for the development of technical control and diagnostic methods; rules for electrical safety and fire safety, rules for the construction and safe operation of facilities PC-3.2 Can determine the methods, equipment, technologies and techniques to be used for specific types of objects; perform control operations, evaluate and identify the results of control and testing, issue conclusions on the results of technical control and diagnostics; organize, conduct and manage calculations and experimental work to assess the technical condition PC-3.3 Has the skills to perform verification calculations, taking into account the identified defects; assessment of the mutual influence of various defects on the technical condition of the control object; determining the need for additional research in order to clarify the determining parameters of the technical condition; development of measures to reduce operational risks based on risk analysis, minimization of operational risks
PC-4	Able to draw up technical documentation for the implementation of the technological process (work schedules, instructions, plans, estimates, requests for materials, equipment, etc.), make an economic assessment of oil and gas fields in accordance with approved forms	PC-4.1 Knows the requirements and GOSTs for the preparation of technical documentation, basic methods of geological and industrial assessment of oil and gas fields; methods of geological-industrial and geological-economic assessment (GEO) of new geological exploration projects, taking into account all the uncertainties and risks of their implementation PC-4.2 Can draw up and draw up technical documentation for the implementation of technological processes in the field of oil and gas field development, transportation and processing of oil and oil products; apply new methods of geological and industrial evaluation of oil and gas fields; determine the geological resources and the probability of finding a deposit, its production potential; carry out planning and evaluation of infrastructure solutions; determination of costs for the discovery and development of a field PC-4.3 Has the methodology for preparing primary reporting, including work schedules, instructions, plans, estimates, applications for materials, equipment according to approved forms
PC-6	Able to organize, manage, and carry out quality control of the main types of work in the development of oil and gas fields, transportation and processing of oil and gas	PC-6.1 Knows: The main types of applied systems for assessing the quality of geological types of work in the development of oil and gas fields, transportation and processing of oil and gas; ISO-9001 quality system, GKZ regulations and classification of oil and gas reserves Requirements of regulatory legal acts of the Russian Federation, local regulations, administrative documents and technical documentation in the field of hydrocarbon production Technological processes of hydrocarbon production

		Purpose, device and principle of operation of equipment for the extraction of hydrocarbon raw materials Physical and chemical properties of hydrocarbon raw materials, chemical reagents, the procedure and rules for their disposal Technological modes, well operation parameters Standards for technological losses of hydrocarbon raw materials during production in accordance with the accepted scheme and development technology The influence of various processes occurring in the reservoir on the productivity factor of a production well The procedure for measuring the productivity factor of a production well Methods for calculating the productivity factor and skin effect according to well surveys with recording the pressure recovery curve Purpose, device and principle of operation of equipment for mechanized production of hydrocarbon raw materials Standards, specifications, guidelines for the development and execution of technical documentation Types of emergencies during well operation, their causes and methods of prevention and elimination Structure, interaction of means of an automated process control system, telemechanics, automatic control systems for hydrocarbon production equipment, ways to control them Requirements for labor protection, industrial, fire and environmental safety PC-6.2 Can: Organize and conduct quality control of work in the development of oil and gas fields, transportation and processing of oil and gas at different stages of the study of specific objects Evaluate the residual life of hydrocarbon production equipment Analyze inflow characteristics in a vertical, horizontal or multilateral well Predict the change in the inflow characteristics from the reservoir to the well, taking into account the reservoir operation mode Develop operating instructions for hydrocarbon production equipment Control the operation of equipment for artificial lift of hydrocarbons Identify wells operating with deviations from the planned regime Conduct emergency drills with subordinate personnel according to the action plan for localization and elimination of accidents and incidents at hydrocarbon production facilities PC-6.3 Has: The methodology for assessing the quality of all types of work in the development of oil and gas fields, transportation and processing of oil and gas at different stages of the study of specific objects Skills for organizing and monitoring the implementation of plans and tasks for the extraction of hydrocarbons Skills for operational management of production and monitoring compliance with hydrocarbon production technology Skills for monitoring compliance with the specified operating mode of well equipment, piping, oil and gas field pipelines, prefabricated pipelines, gas pipelines, pipelines, inhibitor pipelines

		in accordance with the requirements of the technological regulations of the installation, operating instructions and passports of equipment manufacturers Skills to analyze the dynamics of hydrocarbon production. Organization of providing jobs with up-to-date technological documentation Skills in organizing monitoring and control of the operation of the field and wells Skills of control and management of work on the preparation and maintenance of technical documentation of the unit Skills of control and management in the direction of compliance with the requirements of labor protection, industrial, fire and environmental safety in the unit Skills to control and manage the preparation of reports on the production of hydrocarbons
PC-7	Able to manage the work on the diagnostic examination of the main oil pipelines (MOP) and the main oil product pipelines (MOPP) facilities	PC-7.1 Knows: Methods for organizing work on in-line diagnostic inspection of the MOP and MOPP using in-line inspection devices Organizational and administrative documents, regulatory and methodological materials in the field of quality control of work on the diagnostic examination of the MOP and MOPP List of scientific and technical documentation, the use of which is associated with the performance of work on the diagnosis of MOP and MOPP objects The procedure for the formation of long-term development plans in the field of diagnostic work at the facilities of MOP and MOPP The procedure for the development of design, executive and operational documentation for the direction of activity Rules for working with specialized software systems Requirements for labor protection, industrial, fire and environmental safety PC-7.2 Can: Determine the scope and procedure for performing work on the diagnostic examination of the MOP and MOPP Assess the compliance of work performance with the requirements of the technological process for diagnosing objects of MOP and MOPP Determine the composition and sequence of preparatory work for non-destructive quality control of structural elements of objects and structures of MOP and MOPP, mechano -technological equipment and metal structures of MOP and MOPP tanks, technical devices, materials, products, parts, assemblies, welded joints Ensure the prevention and elimination of violations of the production process of diagnosing objects of MOP and MOPP by NDT methods Determine the procedure for performing work to identify defects based on the results of additional flaw detection control of MOP and MOPP objects, including internal ones, measurement and refinement of their parameters Analyze advanced domestic and foreign experience in the field of diagnosing MOP and MOPP objects Use specialized software products in the field of activity Comply with the requirements of industrial safety and labor protection at the facilities of MOP and MOPP

		PC-7.3 Has: Skills in planning work on diagnosing MOP and MOPP objects Skills in managing work on processing the results of diagnosing objects of MOP and MOPP Skills for verification and approval of production documentation for the diagnosis and control of MOP and MOPP facilities Skills to control the regulatory and technical support of work on diagnosing objects of MOP and MOPP Skills to control data entry into specialized software systems, and their verification
PC-8	Able to organize the work of performers, find and make management decisions, rules for ensuring the safety of technological processes, as well as personnel when working in the field, in laboratories, in office processing	PC-8.1 Knows the safety rules and safety precautions when working in the field, in laboratories, during office processing PC-8.2 Can justify and make management decisions in the field of organization and regulation of labor; conduct briefings on ensuring the safety of technological processes, as well as personnel when working in the field, in laboratories, during office processing PC-8.3 Has the methodology for ensuring the safety of technological processes, as well as personnel when working in the field, in laboratories, during office processing

3. INTERNSHIP IN HIGHER EDUCATION PROGRAMME STRUCTURE

The internship refers to the elective component of (B2) block of the higher educational programme curriculum.

Within the higher education programme students also master other disciplines (modules) and / or internships that contribute to the achievement of the expected learning outcomes as results of the internship.

Table 3.1. The list of the higher education programme components that contribute to the achievement of the expected learning outcomes as the internship results

Competence code	**Competence descriptor**	**Previous courses/modules, internships***	**Subsequent courses/modules, internships***
GC-1	Able to search, make a critical analysis of problem situations based on a systematic approach, develop astrategy.	Project management in the oil and gas industry; Economics and management of oil and gas production; Current development of the production of unconventional hydrocarbon resources in the world	Final State Examination
GC-6	Able to identify and implement the priorities of their own activities and ways to improve them based on self-assessment.	History and methodology of subsoil use	Final State Examination
PC-1	Able to use theoretical knowledge when performing technological scientific research in the field of development, transportation	Advanced oil and gas processing equipment and product quality management; Comprehensive analysis of processing, storage and marketing of hydrocarbons; Current development of the production of un-	Final State Examination

Competence code	Competence descriptor	Previous courses/modules, internships*	Subsequent courses/modules, internships*
	and processing of oil and gas	conventional hydrocarbon resources in the world; Innovative technologies for the transportation and storage of hydrocarbons; Geoinformation Systems and Applications; Current Issues of Development of the Oil and Gas Sector; Research Work; Research Work (Obtaining Primary Skills in Research Work)	
PC-2	Able to develop and implement new advanced technologies in the field of geological exploration, evaluation and estimation of hydrocarbon raw materials	Modern aspects of geological and geophysical research in the oil and gas industry; Research Work; Research Work (Obtaining Primary Skills in Research Work)	Final State Examination
PC-3	Able to manage the system for monitoring the technical condition and technical diagnostics at the facilities and plants of the oil and gas complex	Advanced oil and gas processing equipment and product quality management; Diagnostics of oil and petroleum products main pipeline facilities; Fundamentals of construction and operation of pipeline transport; Innovative technologies for the transportation and storage of hydrocarbons; Machinery and equipment for field development and transportation of hydrocarbons; Methods for Oil Production Intensification and Enhanced Oil Recovery; Technological practice (educational); Technological practice (industrial)	Final State Examination
PC-4	Able to draw up technical documentation for the implementation of the technological process (work schedules, instructions, plans, estimates, requests for materials, equipment, etc.), make an economic assessment of oil and gas fields in accordance with approved forms	Advanced oil and gas processing equipment and product quality management; Comprehensive analysis of processing, storage and marketing of hydrocarbons; Diagnostics of oil and petroleum products main pipeline facilities; Improving the efficiency of the production process and operation of equipment for the extraction of hydrocarbons; Innovative technologies for the development of hydrocarbon deposits; Innovative technologies for the transportation and storage of hydrocarbons; Modern aspects of geological and geophysical research in the oil and gas industry; Modern stream in oil and gas processing in	Final State Examination

Competence code	Competence descriptor	Previous courses/modules, internships*	Subsequent courses/modules, internships*
		Russia; Technologies for developing prospective hydrocarbon reserves; Well Repair and Water Breakthrough Control Technologies; Technological practice (educational); Technological practice (industrial)	
PC-6	Able to organize, manage, and carry out quality control of the main types of work in the development of oil and gas fields, transportation and processing of oil and gas	Current development of the production of unconventional hydrocarbon resources in the world; Improving the efficiency of the production process and operation of equipment for the extraction of hydrocarbons; Innovative technologies for the development of hydrocarbon deposits; Machinery and equipment for field development and transportation of hydrocarbons; Modern aspects of geological and geophysical research in the oil and gas industry; Well Repair and Water Breakthrough Control Technologies; Methods for Oil Production Intensification and Enhanced Oil Recovery	Final State Examination
PC-7	Able to manage the work on the diagnostic examination of the main oil pipelines (MOP) and the main oil product pipelines (MOPP) facilities	Diagnostics of oil and petroleum products main pipeline facilities; Fundamentals of construction and operation of pipeline transport; Machinery and equipment for field development and transportation of hydrocarbons; Technological processes of pipeline transport; Well Repair and Water Breakthrough Control Technologies	Final State Examination
PC-8	Able to organize the work of performers, find and make management decisions, rules for ensuring the safety of technological processes, as well as personnel when working in the field, in laboratories, in office processing	Technological practice (industrial); Project management in the oil and gas industry; Economics and management of oil and gas production; Advanced oil and gas processing equipment and product quality management; Modern stream in oil and gas processing in Russia; Technological processes of pipeline transport; Technologies for developing prospective hydrocarbon reserves	Final State Examination

* To be filled in according with the competence matrix of the higher education programme

4. INTERNSHIP WORKLOAD

The total workload of the internship is 6 credits (216 academic hours).

5. INTERNSHIP CONTENTS

*Table 5.1. Internship contents**

Modules	Contents (topics, types of practical activities)	Workload, academic hours
Module 1. Organizational and preparatory	Assignment of an individual task from the supervisor	4
	Workplace safety instruction (in the laboratory and/or production site)	4
Module 2. Main	Study of the practice of enterprises and organizations in accordance with the topic of the master's thesis	92
	Current control of the practice by the supervisor	72
	Keeping internship journal	12
Writing an internship report		9
Preparing for defence and defending the internship report		9
	TOTAL:	**216**

* The contents of internship through modules and types of practical activities shall be FULLY reflected in the student's internship report.

6. INTERNSHIP EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

The infrastructure and technical support necessary for the internship implementation include:
Laboratory of Rational Subsoil Use
Computer with pre-installed licensed software "ARMARIS", Intel Core i5 processor; "Wellhead" — information and measurement system for monitoring and diagnostics of oil production equipment (wall thickness monitoring, corrosion monitoring, temperature, pressure, etc.); flow simulator; electronic corer; gas chromatograph; UV spectrometer; portable vibration analyzer and balancer "Proton-Balance-2"; fluid sampling station; well logging simulator for field geophysics; training ground for well workover and drilling.

Laboratory of Chemistry and Technology of Oil and Gas Refining
Specialized furniture set; technical means: Acer V193L monitor, RAMEC STORM W system unit, keyboard, computer mouse – 4 pcs.; NIKON LV100D microscope; AdventurerPro RV214 electronic laboratory balance; AdventurerPro RV313 electronic laboratory balance; Scimitar 1000 FT-IR Fourier spectrometer; "PRIZMA-ECO" energy-dispersive X-ray fluorescence analyzer; K201-512 high-pressure reactor.

Geoinformatics Laboratory
Specialized furniture set; PC, telepanel.

VR Class
Virtual reality class for managing oil and gas production processes.

7. INTERNSHIP LOCATION AND TIMELINE

The internship can be carried out at the structural divisions of RUDN University (at Moscow-based organisations, as well as those located outside Moscow.

The internship at an external organisation (outside RUDN University) is legally arranged on the grounds of an appropriate agreement, which specifies the terms, place and conditions for an internship implementation at the organisation.

The period of the internship, as a rule, corresponds to the period indicated in the training calendar of the higher education programme. However, the period of the internship can be rescheduled upon the agreement with the Department of Educational Policy and the Department for the Organization of Internship and Employment of RUDN students.

8. RESOURCES RECOMMENDED FOR INTERNSHIP

Main readings:

1. Tetelmin, V. V. Oil and Gas Engineering. Complete course. Volume 1: textbook / V. V. Tetelmin. – 3rd ed. – Moscow; Vologda: Infra-Engineering, 2024. – 416 p. – ISBN 978-5-9729-2021-1. – Text: electronic. – URL: https://znanium.ru/catalog/product/2170585

2. Tetelmin, V. V. Oil and Gas Engineering. Complete course. Volume 2: textbook / V. V. Tetelmin. – 3rd ed. – Moscow; Vologda: Infra-Engineering, 2024. – 400 p. – ISBN 978-5-9729-2022-8. – Text: electronic. – URL: https://znanium.ru/catalog/product/2170586

3. Collection, transport and storage of oil at fields: practicum / Ministry of Education and Science of the Russian Federation, Federal State Autonomous Educational Institution of Higher Education "North Caucasus Federal University"; compiled by L.M. Zinovieva, V.V. Verzhbitsky et al. – Stavropol: NCFU, 2017. – 126 p. – URL: http://biblioclub.ru/index.php?page=book&id=483759

Additional readings:

4. Alekseenkov, S.O. Fuel and Energy Complex of Russia. Problems and trends in market development / S.O. Alekseenkov; edited by G.M. Kaziakhmedov. – Moscow: UNITY-DANA: Law and Right, 2016. – 103 p. – URL: http://biblioclub.ru/index.php?page=book_red&id=446538

1. Internet sources

- 1. Electronic libraries (EL) of RUDN University and other institutions, to which university students have access on the basis of concluded agreements:
- - RUDN Electronic Library System (RUDN ELS) http://lib.rudn.ru/MegaPro/Web
- - EL "University Library Online" http://www.biblioclub.ru
- - EL "Yurayt" http://www.biblio-online.ru
- - EL "Student Consultant" www.studentlibrary.ru
- - EL "Lan" http://e.lanbook.com/
- - EL "Trinity Bridge"

2. Databases and search engines:

- electronic foundation of legal and normative-technical documentation http://docs.cntd.ru/
- Yandex search engine https:// www .yandex.ru/
- Google search engine https://www.google.ru/
- Scopus abstract database http://www.elsevierscience.ru/products/scopus/

The training toolkit and guidelines for a student to do an internship, keep an internship diary and write an internship report:*

1. Safety regulations to do the internship (safety awareness briefing).

2. Machinery and principles of operation of technological production equipment used by students during their internship; process flow charts, regulations, etc.

3. Guidelines for keeping an internship diary and writing an internship report.

*The training toolkit and guidelines for the internship are placed on the internship page in the university telecommunication training and information system under the set procedure.

9. ASSESSMENT TOOLKIT AND GRADING SYSTEM* FOR EVALUATION OF STUDENTS' COMPETENCES LEVEL AS INTERNSHIP RESULTS

The assessment toolkit and the grading system* to evaluate the level of competences (competences in part) formation as the internship results are specified in the Appendix to the internship syllabus.

* The assessment toolkit and the grading system are formed on the basis of the requirements of the relevant local normative act of RUDN University (regulations / order).

DEVELOPERS:

Professor of the Department of Mineral Developing and Oil&Gas Engineering	Tyukavkina O.V.
position, educational department	name and surname

Head of Department:

Head of the Department of Mineral Developing and Oil&Gas Engineering	Kotelnikov A.E.
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Head of Educational Programme:

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