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

Research work (obtaining primary skills in research work) / Научно-исследовательская работа (получение первичных навыков научно-исследовательской работы)

internship title

Educational

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

2025

1. INTERNSHIP GOAL(s)

The goal of the Internship «Research work (obtaining primary skills in research work) / Научно-исследовательская работа (получение первичных навыков научно-исследовательской работы)» is the preparation of the undergraduate both for independent research, the main result of which is the writing and successful defense of the master's thesis, and for conducting scientific research as part of a creative team; as well as the formation of a master's general cultural, personal and professional competencies aimed at developing the skills of planning and organizing scientific research and the ability to conduct R&D using various equipment and computer technologies.

The main objectives of the R&D work are:

- to process the results obtained, analyze, and present them in the form of completed research developments (research report, abstracts, scientific articles, term papers, master's thesis);
- to formalize the results of the work performed in accordance with the requirements;
- to be responsible for the quality of work performed;
- to develop other skills and abilities necessary for a master's student in a specific master's program.

2. REQUIREMENTS FOR LEARNING OUTCOMES

The internship «Research work (obtaining primary skills in research work) / Научно-исследовательская работа (получение первичных навыков научно-исследовательской работы)» 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)
GPC-1	Able to solve production and/or research tasks based on fundamental knowledge in the oil and gas field.	GPC-1.1. Knows the methods and technologies (including the innovative ones) of development in the field of oil and gas engineering, scientific and methodological support of professional activity, principles of professional ethics. GPC-1.2. Can carry out research activities for the development and implementation of innovative technologies in the field of oil and gas engineering; develop programs for monitoring and evaluating the results of the implementation of professional activities; develop information and methodological materials in the field of professional activity; use the fundamental knowledge of professional activity to overcome specific challenges of oil and gas production. GPC-1.3. Has the skills of physical and software modeling of separate fragments of the process of choosing the best option for specific conditions; skills in analyzing the causes for the quality reduction of technological processes and suggests effective methods to improve the quality of work in various technological operations; the skills in the use of modern tools and methods for planning and controlling projects related to the complications arising in the course of work.
GPC-3	Able to develop scientific and technical, design and service	GPC-3.1. Knows methods for assessing the types of entrepreneurial activities used in the enterprise.

Competence code	Competence descriptor	Competence formation indicators (within this course)
	documentation, draw up scientific and technical reports, surveys, publications, reviews	GPC-3.2. Can use the basics of logistics, in relation to an oil and gas enterprise, when the main technological operations are performed in conditions of uncertainty; put into practice the elements of production management; use the opportunities for entrepreneurial activities at the entrusted facility and its legislative regulation; find the possibility of combining the performance of basic duties with elements of entrepreneurship. GPC-3.3. Has the skills of personnel management in a small production unit.
GPC-5	Able to evaluate the results of scientific and technical developments, scientific research and justify their own choice, systematizing and summarizing achievements in the oil and gas industry and related fields	GPC-5.1. Knows the complex of modern technological processes and productions in the field of oil and gas engineering; the modern innovative achievements and scientific research carried out at the present stage; methods and principles of systematization and generalization of achievements in the oil and gas industry and related fields; main technologies for search, exploration and organization of oil and gas production in Russia and abroad, the standards and specifications, sources of information, mass media and multimedia technologies. GPC-5.2. Can consciously perceive information, independently search, extract, systematize, analyze and select information necessary for solving problems, organize, transform, store and transmit it; interpret the results of laboratory and technological studies in respect to specific conditions. GPC-5.3. Has the methods of collecting, processing and interpreting information received, using modern information technologies and applied hardware and software, methods of protecting, storing and presenting information.
GPC-6	Able to participate in the implementation of basic and additional professional educational programs, using special scientific and professional knowledge	GPC-6.1. Knows the requirements of educational standards, the regulatory framework for organizing educational activities, the value bases of education and professional activities, the essence, structure, possibilities of using the educational environment to achieve personal, meta-substantial and substantial learning outcomes and ensure the quality of the educational subject being taught, safety requirements for the educational environment. GPC-6.2. Can communicate with the audience, interest listeners, independently plan educational work within the framework of the educational program in subjects based on his own developments. GPC-6.3. Has the skills of engineering communication, the basics of management in the organization of teamwork in the performance of a certain research task.
SPC-1	Able to use theoretical knowledge when performing technological scientific research in the field of development, transportation and processing of oil and gas	SPC-1.1 Knows the fundamental concepts in the field of geology of oil and gas fields, the methods of forecasting, prospecting and exploration of mineral deposits; the regulatory and methodological documents in the field of hydrocarbon production and development of oil and gas fields. SPC-1.2 Can use theoretical knowledge and mining and geological information to carry out technological scientific

Competence code	Competence descriptor	Competence formation indicators (within this course)
		research, as well as apply knowledge of regulatory and methodological documents to assess oil and gas fields SPC-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.
SPC-2	Able to develop and implement new advanced technologies in the field of geological exploration, evaluation and estimation of hydrocarbon raw materials	SPC-2.1 Knows the methodological provisions, instructions and requirements for the geological study of the subsoil and geological exploration; the reserve estimation and management policy of the organization; 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. SPC-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 exploration activities. SPC-2.3 Has the skills for studying Russian and foreign experience in matters of assessing and managing reserves; skills for preparing proposals for new methods and technologies in the field of geological exploration and reserve estimation; skills for supervising the execution of case studies and R&D activities.

3. INTERNSHIP IN HIGHER EDUCATION PROGRAMME STRUCTURE

The internship refers to the core 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*
GPC-1	Able to solve production and/or research problems based on fundamental knowledge in the oil and gas field.	Modern aspects of geological and geophysical research in the oil and gas industry / Современные аспекты геолого-промысловых и геофизических исследований в нефтегазовом деле	SFC

Competence code	Competence descriptor	Previous courses/modules, internships*	Subsequent courses/modules, internships*
		Modern stream in oil and gas processing in Russia / Современные направления нефтегазопереработки в России Current development of the production of unconventional hydrocarbon resources in the world / Современное развитие добычи нетрадиционных ресурсов углеводородов в мире Technological practice (educational) / Технологическая практика (учебная) Technological practice (industrial) / Технологическая практика (производственная)	
GPC-3	Able to develop scientific and technical, design and service documentation, draw up scientific and technical reports, surveys, publications, reviews	Technological processes of pipeline transport / Технологические процессы трубопроводного транспорта Technological practice (educational) / Технологическая практика (учебная) Technological practice (industrial) / Технологическая практика (производственная)	SFC
GPC-5	Able to evaluate the results of scientific and technical developments, scientific research and justify their own choice, systematizing and summarizing achievements in the oil and gas industry and related fields	History and methodology of subsoil use / История и методология недропользования Geoinformation Systems and Applications / Геоинформационные системы и их применение	SFC
GPC-6	Able to participate in the implementation of basic and additional professional educational programs, using special scientific and professional knowledge	History and methodology of subsoil use / История и методология недропользования	SFC
SPC-1	Able to use theoretical knowledge when performing technological scientific research in the field of development, transportation and processing of oil and gas	Geoinformation Systems and Applications / Геоинформационные системы и их применение Current development of the production of unconventional hydrocarbon resources in the world / Современное развитие добычи нетрадиционных ресурсов углеводородов в мире	Research work / Научно-исследовательская работа Pre-graduation Practical Training / Преддипломная практика SFC

Competence code	Competence descriptor	Previous courses/modules, internships*	Subsequent courses/modules, internships*
SPC-2	Able to develop and implement new advanced technologies in the field of geological exploration, evaluation and estimation of hydrocarbon raw materials		Research work / Научно-исследовательская работа Pre-graduation Practical Training / Преддипломная практика SFC

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

4. INTERNSHIP WORKLOAD

The total workload of the internship is 3 credits (108 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	2
	Workplace safety instruction (in the laboratory and/or production site)	4
	Selection and approval of the research topic, study of the degree of scientific development of the problem	4
Module 2. Main	Research stage. Observation and information collection activities	20
	Stage of processing and analysis of the collected information. Processing and systematization of factual and literary material	20
	Data prediction	30
	Current control of the practice by the supervisor	5
	Keeping practice journal	5
Writing an internship report		9
Preparing for defence and defending the internship report		9
	TOTAL:	**108**

* 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

Bld. 5, 8, Podolskoye Highway Classroom: room No. 2037	A set of specialized furniture; chalk board; projection screen; laptop
Bld. 5, 8, Podolskoye Highway Laboratory of Rational Subsurface Use No. 2035	Computer with pre-installed licensed software "ARMARIS" Intel Core 15 processor; "Wellhead equipment" - mock-up bench; 32” LED TV 3D on a rack; Layout - controller "Electon-09 1" from SU " Electon 05-250 » in compact design
Bld. 5, 8, Podolskoye Highway Laboratory of Chemistry and Technology of oil and gas processing	A set of specialized furniture; hardware: Acer V193L monitor, RAMEC STORM W system unit, keyboard, computer mouse-4; Plotter Hewlett Packard C7770B; Creative WebCam Live Motion 1 Camera, NIKON

	LV100D Microscope, AdventurerProRV214 Electronic Laboratory Balance, AdventurerProRV313 Electronic Laboratory Balance, Scimitar1000FT-IR IR Fourier Spectrometer, energy dispersive X-Ray fluorescence analyzer "PRISMA-ECO", High pressure reactor K201-512
Bld. 5, 8, Podolskoye Highway Laboratory of Rational subsurface use No. 2039	A set of specialized furniture; training stand for experimental determination of pump characteristics, training stand, drilling rig
Bld. 5, 8, Podolskoye Highway Computer class No. 2033	A set of specialized furniture; PC, telepanel

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. Organization of research work of undergraduates: workshop / Ministry of Education and Science of the Russian Federation, Federal State Autonomous Educational Institution of Higher Professional Education "North Caucasus Federal University"; auth.-stat. O.V. Solovieva, N.M. Borozinets . - Stavropol: NCFU, 2016. - 144 p.
http://biblioclub.ru/index.php?page=book&id=459348
2. Demchenko, Z.A. Methodology of research activities: teaching aid / Z.A. Demchenko, V.D. Lebedev, D.G. Myasishchev; Ministry of Education and Science of the Russian Federation, Federal State Autonomous Educational Institution of Higher Professional Education Northern (Arctic) Federal University. M.V. Lomonosov. - Arkhangelsk: NArFU, 2015. - 84 p.
http://biblioclub.ru/index.php?page=book&id=436330

Additional readings:

1. Astanina S.Yu. Research work of students (modern requirements, problems and their solutions): Monograph / Astanina S.Yu., Shestak N.V., Chmykhova E.V. ; Astanina S.Yu. - Moscow: Modern Humanitarian Academy, 2012. - 156 p.
http://www.iprbookshop.ru/16934
2. Shestak N.V. Research activities at the university (Basic concepts, stages, requirements) / Shestak N.V., Chmykhova E.V.; Shestak N.V. - Moscow: Modern Humanitarian Academy, 2007. - 179 p.
http://www.iprbookshop.ru/16935

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:

Associate 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.
position, educational department	name and surname

Head of Educational Programme:

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