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Информация о владельце:  
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Должность: Ректор  
Дата подписания: 28.05.2024 11:42:45  
Уникальный программный ключ:  
ca953a0120d891083f939673078ef1a989dae18a

**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

**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

## 1. INTERNSHIP GOAL(s)

The goal of the Internship «Research work / Научно-исследовательская работа» 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 «Research work / Научно-исследовательская работа» 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 / Научно-исследовательская работа» is aimed at the development of the following competences (competences in part):

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

<b>Competence code</b>	<b>Competence descriptor</b>	<b>Competence formation indicators (within this course)</b>
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 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 SPC-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 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

Competence code	Competence descriptor	Competence formation indicators (within this course)
		<p>proposals and take prompt measures aimed at improving the quality of exploration activities</p> <p>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 research and development activities</p>
SPC-3	<p>Able to assess resources, calculate estimate and recalculate re-estimate hydrocarbon reserves for the preparation of scientific and technological projects planning.</p>	<p>SPC-3.1 Knows the current legislative, regulatory legal acts of the Russian Federation, norms and rules in the field of assessing reserves and managing reserves; regulations, provisions, instructions and standards of the organization in reserve estimation and management; rules for compiling documentation for ongoing exploration programs; rules for compiling documentation for prospective exploration programs; rules for drawing up planning documentation; norms and rules for the development of project documentation; the quality policy of the organization in the field of geological exploration; technologies for conducting, processing and interpreting geological and geophysical works; features of geological exploration.</p> <p>SPC-3.2 Can develop recommendations for further study of the deposit to clarify the geological structure and reserves; apply the requirements of regulatory documents in the assessment of hydrocarbon resources and reserves; prepare materials used in the development of exploration programs for reserve estimation and management; draw up documentation for current and prospective exploration programs; analyze the quality of current exploration programs for reserve estimation and management; control the implementation and results of the development of current and prospective work programs for reserve estimation and management.</p> <p>SPC-3.3 Has the skills to analyze and evaluate the organization's resource base; skills in the development of current and prospective programs of geological exploration in order to clarify hydrocarbon reserves in the territory of the organization; the skills for high-quality and timely estimation (re-estimation) of reserves for individual objects; the skills for preparation in the established order of operational reporting</p>

### 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*
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 Research work (obtaining primary skills in research work) / Научно-исследовательская работа (получение первичных навыков научно-исследовательской работы)	Pre-graduate practice / Преддипломная практика SFC
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 (obtaining primary skills in research work) / Научно-исследовательская работа (получение первичных навыков научно-исследовательской работы)	Pre-graduate practice / Преддипломная практика SFC
SPC-3	Able to assess resources, estimate and re-estimate hydrocarbon reserves for scientific and technological projects planning	Research work (obtaining primary skills in research work) / Научно-исследовательская работа (получение первичных навыков научно-исследовательской работы)	Pre-graduate practice / 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 12 credits (432 academic hours).

#### 5. INTERNSHIP CONTENTS

Table 5.1. Internship contents\*

Modules	Contents (topics, types of practical activities)	Workload, academic hours
Section 1. Organizational and preparatory	Receiving an individual task from the head	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	10
Section 2. Main	Research stage. Observation and information collection activities	100
	Stage of processing and analysis of the collected information. Processing and systematization of factual and literary material	170
	Data prediction	100
	Current control of the practice by the the supervisor	18
	Keeping the supervisor journal	10
Preparation of practice report		9
Preparation for defense and defense of the practice report		9

Modules	Contents (topics, types of practical activities)	Workload, academic hours
<b>TOTAL:</b>		<b>432</b>

\* 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. 360	A set of specialized furniture; chalk board; technical means: projection screen; multimedia projector SANYO plc xt20; system block DEPO Neos 220
Bld. 5, 8, Podolskoye Highway Mining Machinery Laboratory No. 358	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 rational subsoil use No. 337	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 Mining machine laboratory No. 362	A set of specialized furniture; Drilling simulator "Transas SHELF 6000 Drill"; Additional trainee seat for the drilling simulator "Transas SHELF 6000 Drill"
Bld. 5, 8, Podolskoye Highway Laboratory of hydrodynamic processes of oil and gas production No. 341	Ejector; Bench desktop, Instrumentation and shut-off and control valves; Tank; Pump-ejector system bench, left view; laser diode; Column with liquid; Air compressor; Gas supply system to the column; Gas meter; pressure gauge; Photodiode; Digital oscilloscope

## 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](http://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/](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

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position, educational department

Tyukavkina O.V.

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name and surname

**Head of Department:**

Head of the Department of Mineral Developing  
and Oil&Gas Engineering

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position, educational department

Kotelnikov A.E.

---

name and surname

**Head of Educational Programme:**

Professor of the Department of Mineral Develop-  
ing and Oil&Gas Engineering

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position, educational department

Kapustin V.M.

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name and surname