

**Federal State Autonomous Educational Institution for Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA
NAMED AFTER PATRICE LUMUMBA
(RUDN University)**

Academy of Engineering

(name of the educational division - developer of the HEP HE)

INTERNSHIP SYLLABUS

Research Work (Geological and Geophysical Survey). Part 1

(internship title)

Industrial

(internship type)

Recommended by the Didactic Council for the Education Field of:

05.04.01 Geology

(code and name of the Higher Education Field)

**The student's internship is implemented within the Higher Education Programme of
Higher Education (HEP HE):**

Mining Geology

(name (profile/specialization) of the Higher Education Program)

1. INTERNSHIP AIM

The aim of the Internship «Research Work (Geological and Geophysical Survey). Part 1» is the consolidation of theoretical knowledge gained in the learning process, the acquisition of practical skills and the formation of professional competencies in the field of research work related to solving complex professional problems in geology, geophysics and hydrogeology of ore deposits.

2. REQUIREMENTS FOR LEARNING OUTCOMES

The internship «Research Work (Geological and Geophysical Survey). Part 1» is aimed at the formation of the following competencies (parts of competencies) of students:

Table 2.1. List of competencies formed by students during the practice (learning outcomes based on the results of the practice)

Code	Competence	Competence achievement indicators (within this practice)
GPC-1	Capable of using the theoretical foundations of special and new sections of geological sciences to solve professional activity problems.	GPC-1.1. Knowledge of the basics of special and new sections of geological sciences; GPC-1.2. GPC-1.2. Selects a method or technique to solve a professional problem; GPC-1.3; GPC-1.3. Knows how to select a method or method of solving a professional problem.
GPC-2	Able of independently formulating the research objectives and establishing a sequence for resolving professional problems.	GPC-2.1. Knows the basics and methods of organizing research activities, methods of setting goals and methods of achieving them; GPC-2.2. is able to develop research methods; GPC-2.3. has methods of establishing cause-effect relationships and identifying the most significant among them and skills of independent formulation of research objectives.
GPC-3	Accomplished of totally independent generalizing the results obtained while solving professional problems and developing recommendations for their practical application.	GPC-3.1 Know the theoretical foundations of the generalization of results and development of recommendations; GPC-3.2. be able to summarize the results obtained in the process of solving professional tasks, develop recommendations for their practical use; GPC-3.3. Have the skills to summarize the results obtained in the process of solving professional tasks and develop recommendations for their practical use.
PC-1	Capable of processing geological data, modeling ore bodies with modern software, resolving quality and mineral reserve management issues, and developing engineering and geological surveying measures for the territory.	PC-1.2. Is able to apply methods of geological data processing, build ore body models, solve problems on quality and mineral reserves management, develop measures for engineering and geological study of the territory; PC-1.3. Have the skills to process geological data and build models of ore bodies using modern software.
PC-2	Capable of justifying the need, choosing the best methodology, planning, implementing, interpreting results, and	PC-2.2 Know how to select the best methodology, design, implement, interpret the results of geophysical works.

Code	Competence	Competence achievement indicators (within this practice)
	supervising geophysical work at various stages of mineral site development.	
PC-4	Capable of designing, assisting with, and supervising a geologic study of a subsoil area at various stages of development.	PC-4.2 Be able to apply methodological solutions in the design and implementation of the geological study of a subsoil area at various stages of its development; PC-4.3 Be able to apply the acquired knowledge and skills in the design, support and management of the geological study of a subsoil area at various stages of its development.

3. INTERNSHIP IN HIGHER EDUCATION PROGRAMME STRUCTURE

«Research Work (Geological and Geophysical Survey). Part 1» refers to the compulsory part.

As part of the HEP HE, students also master disciplines and/or other practices that contribute to the achievement of the planned learning outcomes of the practice «Research Work (Geological and Geophysical Survey). Part 1».

Table 3.1. The list of the HEP HE's components that contribute to the achievement of the planned learning outcomes of the practice

Code	Name of competence	Previous disciplines/modules, practices*	Subsequent disciplines/modules, practices*
GPC-1	Capable of using the theoretical foundations of special and new sections of geological sciences to solve professional activity problems.	Geological and Geophysical Basics of Mineral Prospecting and Exploration Engineering and Geological Support of Subsoil Use Mining Geology Hydrogeology Mining Hydrogeology	Final State Examination
GPC-2	Able of independently formulating the research objectives and establishing a sequence for resolving professional problems.	Geological and Geophysical Basics of Mineral Prospecting and Exploration Modelling of Mineral Deposits Applied Groundwater Modeling	Final State Examination
GPC-3	Accomplished of totally independent generalizing the results obtained while solving professional problems and developing recommendations for their practical application.	Sustainable Mining	Final State Examination
PC-1	Capable of processing geological data, modeling ore bodies with modern software, resolving quality and	Geological and Geophysical Basics of Mineral Prospecting and Exploration / Геолого-геофизические основы поисков и разведки полезных ископаемых	Pre-Graduation Practice

Code	Name of competence	Previous disciplines/modules, practices*	Subsequent disciplines/modules, practices*
	mineral reserve management issues, and developing engineering and geological surveying measures for the territory.	Engineering and Geological Support of Subsoil Use Modelling of Mineral Deposits	
PC-2	Capable of justifying the need, choosing the best methodology, planning, implementing, interpreting results, and supervising geophysical work at various stages of mineral site development.	Regional Geology. Geology of Central and Southern Africa Geological and Geophysical Basics of Mineral Prospecting and Exploration Mining Geology Modelling of Mineral Deposits Hydrogeology Mining Hydrogeology Introductory Practical Training	Final State Examination
PC-4	Capable of designing, assisting with, and supervising a geologic study of a subsoil area at various stages of development.	Regional Geology. Geology of Central and Southern Africa Geological and Geophysical Basics of Mineral Prospecting and Exploration Mining Geology Modelling of Mineral Deposits Hydrogeology Mining Hydrogeology Introductory Practical Training	Pre-Graduation Practice

* - to be filled in accordance with the matrix of competencies and Sustainable Educational Plan HEP HE

4. SCOPE OF PRACTICE

Course workload «Research Work (Geological and Geophysical Survey). Part 1» is 6 credit units (216 academic hours).

5. CONTENT OF PRACTICE

Table 5.1. The content of the research work (hereinafter referred to as "RW") *

Name of practice section	Contents of the section (topics, types of practical activities)	Workload, ac. hrs.
<i>Semester 3 (dispersed) – Part 1</i>		
Section 1. Organizational and preparatory	Assignment of an individual task from the supervisor	1
	Workplace safety instruction (in the laboratory and/or production site)	1
Section 2. Main	Search and collection of materials and data in accordance with the individual task, determine the methods and sequence of tasks	72
	Conducting research work (topic chosen by the supervisor): - definition of goals and objectives; - definition of the methods of solving the problems; - theoretical substantiation of the work performed.	70

Name of practice section	Contents of the section (topics, types of practical activities)	Workload, ac. hrs.
	Registration of the results of research in the form of an interim report, including a bibliographical review (history of geological study) of the object of research.	70
Ongoing supervision of the internship by the supervisor		2
TOTAL:		216

* - the content of RW by sections and types of practical training is FULLY reflected in the student's RW report.

6. MATERIAL AND TECHNICAL SUPPORT FOR PRACTICE

During stationary RW at the RUDN University, depending on individual assignment, any laboratories of the Department of Subsoil and Oil & Gas Engineering, the RUDN Library, that comply with current sanitary and fire safety norms as well as safety requirements at the enterprise, workplace and when working with certain production/laboratory equipment can be used.

In case of stationary or offsite internship in Moscow or outside Moscow, students are provided with rooms that comply with current sanitary and fire safety norms, as well as safety requirements at the enterprise, workplace and when working with certain production/laboratory equipment.

The student can come up with the initiative of the place of RW. The direction of professional activity of the organization proposed by the student for the RW should correspond to the profile of the educational program and types of professional activity, for which the graduate of the program is preparing. The place of RW must be agreed with the head of the department with the subsequent (in the case of a positive decision) the conclusion of the relevant contract with the proposed organization of the student.

7. PRACTICE METHOD

«Research Work (Geological and Geophysical Survey). Part 1» can be carried out both in the structural divisions of RUDN University or in the organizations of Moscow (inside practice), and at bases located outside of Moscow (outside practice).

The practice on the basis of an external organization (outside RUDN University) is carried out on the basis of an appropriate agreement, which specifies the terms, place and conditions for conducting an internship in the host organization.

The timing of the practice corresponds to the period specified in the academic schedule of the HEP HE. The timing of the internship can be adjusted upon agreement with the Department of Educational Policy and the Department for the organization of practices and student employment at RUDN University.

8. EDUCATIONAL AND METHODOLOGICAL AND INFORMATION SUPPORT FOR PRACTICE

Main literature:

1. Kennett, Brian. *Planning and Managing Scientific Research: A Guide for the Beginning Researcher*. ANU Press, 2014. <http://www.jstor.org/stable/j.ctt6wp816>
URL: <https://directory.doabooks.org/handle/20.500.12854/34840>

URL: <https://library.oapen.org/bitstream/20.500.12657/33421/1/477381.pdf>

2. Roger Marjoribanks. Geological Methods in Mineral Exploration and Mining. Springer-Verlag Berlin Heidelberg, 2010 (Second Edition). - P. 233. — URL: <https://www.geokniga.org/bookfiles/geokniga-geological-methods-mineral-exploration-and-mining.pdf>

3. Griffiths D.H., King R.F. Applied Geophysics for Geologists and Engineers. The Elements of Geophysical Prospecting. 2nd Ed. — Pergamon Press, 1988. — 236 p. — ISBN: 0-08-022071-1. — URL: <https://www.geokniga.org/bookfiles/geokniga-applied-geophysics-geologists-and-engineers.pdf>

<https://www.geologyseeker.com/2022/05/geological-methods-in-mineral.html>

The basic literature can be expanded and recommended by the head of RW individually to each student in accordance with the individual assignment.

Additional literature:

1. Haldar S.K. Mineral Exploration Principles and Applications, 2nd Edition. Elsevier, 2018. — 378 p. — URL: <https://www.geologyseeker.com/2022/06/mineral-exploration-principles-and.html>

2. Chernova N. I. Fundamentals of cartography and geoinformatics: tutorial / N. I. Chernova, N. V. Katakova. - Moscow : RTU MIREA, 2021 - Part 1 - 2021. - 88 c. - Text : electronic // Lan' : electronic library system. - URL: <https://e.lanbook.com/book/182567>. - Access mode: for authorized users.

3. Chernova N. I. Fundamentals of Cartography and Geographic Information Systems : tutorial / N. I. Chernova, N. V. Katakova. - Moscow : RTU MIREA, 2022 - Part 2. - 82 c. - Text : electronic // Lan' : electronic library system. - URL: <https://e.lanbook.com/book/239978>. - Access mode: for authorized users.

4. Deb P.K. An Introductory to Mine Hydrogeology. Springer Cham Heidelberg New York Dordrecht London, 2014. XIV, 54 p. 12 illus., 3 illus. in color. — ISBN: 978-3-319-02987-0, ISBN: 978-3-319-02988-7 (eBook), DOI 10.1007/978-3-319-02988-7 — (SpringerBriefs in Water Science and Technology). — URL: <https://sciarium.com/file/115505/>

5. Brassington R. Field Hydrogeology, 4th Edition. — John Wiley & Sons Ltd, 2017. — 304 p. — (The Geological Field Guide Series) — ISBN: 9781118397367. — URL: <https://sciarium.com/file/268418/>

6. Broder J. Merkel, Andrea Hasche-Berger. Uranium, Mining and Hydrogeology. Springer Berlin, Heidelberg, 2008. — 980 p. — ISBN: 3540877452. — URL: https://avxhm.se/ebooks/3540877452_hydrogeology.html

Additional literature may be expanded and/or modified and recommended by the supervisor of RW individually to each student in accordance with the individual assignment.

Internet-(based) sources:

1. Electronic libraries with access for RUDN students:

- RUDN Electronic Library System – RUDN ELS <http://lib.rudn.ru/MegaPro/Web>
- ELS “University Library Online” <http://www.biblioclub.ru>
- ELS Yurayt <http://www.biblio-online.ru>
- ELS “Student Consultant” www.studentlibrary.ru

- ELS “Lan” <http://e.lanbook.com/>
- ELS “Trinity Bridge” <http://www.trmost.ru>

2. Databases and search engines:

- Electronic Fund of Legal and Normative-technical Documentation <http://docs.cntd.ru/>
- Yandex search engine <https://www.yandex.ru/>
- Google search engine <https://www.google.ru/>
- abstract database SCOPUS <http://www.elsevierscience.ru/products/scopus/>
- Геологический портал GeoKniga <http://www.geokniga.org>
- Geological Survey of Tanzania (GST) <https://www.gst.go.tz>
- Tanzania Geological Society (TGS) <https://www.tgs.or.tz>
- <https://www.gst-datashop.com>

3. Additional sources:

- Mining Hydrogeology <https://www.dunnhydrogeo.com/home/mining-hydrogeology-t>

*Educational and methodological materials for the practice, filling out a dairy/journal and preparing a practice report *:*

1. Rules for safe working conditions and fire safety during the practice «Research Work (Geological and Geophysical Survey). Part 1» (initial briefing).

2. Guidelines for filling in a dairy/journal by students and preparing a RW report.

* - all educational and methodological materials for independent work of students are placed in accordance with the current procedure on the page of the subject in LMS TUIS!

8. ASSESSMENT AND EVALUATION TOOLKIT AND GRADING CRITERIA

Assessment and Evaluation Toolkit (AET), Grading System (GS)* for assessing the level of competence (part of competence) for the Internship «Research Work (Geological and Geophysical Survey). Part 1» are presented in the Appendix to the Internship Syllabus of the subject.

* - AET and GS are formed on the basis of the requirements of the relevant local normative act of the RUDN University.

DEVELOPERS:

**Associate Professor of the
Department of Subsoil Use and
Oil&Gas Engineering**

Position, Department



Signature

A. Kotelnikov

Full name

**Associate Professor of the
Department of Subsoil Use and
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Position, Department



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HEAD of Department:
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