

*Federal state autonomous educational institution of higher professional education  
“People’s Friendship University of Russia”*

**Ecological faculty**

**PERMANENT WORKING PRCTICUM PROGRAM**

**Training type:** Research training

**Direction:** 05.06.01 “Earth Sciences”

**Profile:** Ecology: Modern environmental studies

Moscow 2017

## Developers

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ДОЛЖНОСТЬ	ПОДПИСЬ	ИНИЦИАЛЫ, ФАМИЛИЯ
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## 1. Research training tasks and objectives

The goal of the research training of a graduate student is to acquire practical skills for independent research work, collecting materials for writing a dissertation and checking the validity of the theoretical conclusions made in the final qualifying work.

Research training is a type of educational work aimed at expanding and consolidating the theoretical and practical knowledge gained by graduate students in the learning process.

Also the purpose of the research training of a graduate student are:

- Acquisition of practical self-management skills of the research work;
- Mastering a graduate student in the methodology and methodology of research work;
- Consolidation of theoretical knowledge gained during practical, laboratory and research classes,
- The use of modern information technologies;
- The acquisition of skills and habits of obtaining, processing, storing and disseminating of scientific information;
- Collection and analysis of data required for research.

### **The main objectives of research training are:**

- the formation and improvement of the skills of carrying out independent scientific research for the preparation of a thesis;
- the formation of the skill of speaking at scientific conferences with the presentation of research materials, participation in scientific discussions;
- formation of the skill of presenting the results of the conducted research in the form of an article, publication, report;
- familiarization with the research program of the organization (department, laboratory, research institute, department), in which the practice is conducted;
- mastering modern methods and methodology of scientific research;

## 2. Place of practice in the structure of the EP

Research training refers to the variable part of Block 2 of the curriculum. Its passage is based on the material of previous disciplines and / or practices, and it is also the basis for studying subsequent disciplines and / or practices of the curriculum, a list of which is presented in Table 1.

Research training in the system of training of higher qualifications is a component of professional training for research activities in a higher educational institution and is a kind of practical activity of graduate students in the implementation of scientific work in higher education, including research in framework of the topic of final qualifying work (PhD dissertation), approbation of the results obtained and writing of the dissertation.

Research training for students in basic educational programs (profiles) of postgraduate studies in the direction of "Earth Sciences" is part of the educational component provided by the curriculum and the logical conclusion of the research work.

For successful research work, a graduate student must have preliminary training in professional courses, possess the initial skills of a scientific search, be able to work independently with the main information sources, select literature on a given topic, prepare abstract reviews on the topic of research, have skills use of information technology and databases.

## 3. Ways of teaching practicum providing

- stationary.\

The main form of research training is research work.

The training takes place in the framework of the implementation of the curriculum for the preparation of graduate students.

At the end of the research training, the graduate student protects the progress report.

#### 4. The period of practicum and types of educational work

Table 2 – Practicum volume and types of work

Types of educational work		Всего, ак. часов	Семестр 1256
Contact work with the teacher, including control		52	26, 26
Other types of work, including practicum diary and report		1136	1136
Type of certification test			Зачет с оценкой
Total volume	Academic hours	1188	432, 756
	Credit units	33	12, 21

#### 5. Place of research training

The research training of the graduate student is carried out at the university at the corresponding department, (if necessary) in the laboratories on the specifics of the research, on the field objects and libraries. The place of training is determined by taking into account the topic of the graduate qualification work (master's thesis) of the student.

The student himself can come up with an initiative about the place of training. The direction of the professional activity of the organization offered to students for practical training should correspond to the profile of the educational program and the types of professional activity the graduate of the program is prepared for. The training place must be agreed with the head of the department / department with the subsequent (with a positive decision) conclusion of the relevant agreement with the proposed learning organization.

#### 6. The list of planned results of internship, correlated with the planned results of the development of the educational program

As a result of this practical training, the student should acquire the following practical skills, abilities, universal and general professional competencies:

general professional competencies	
The ability to independently carry out research activities in the relevant professional field using modern research methods and information and communication technologies	GPC-

<b>Basic competencies</b>		
The ability to critically analyze and evaluate current scientific achievements, generate new ideas in solving research and practical problems, including in interdisciplinary areas		BC 1
The ability to design and carry out complex studies, including interdisciplinary, on the basis of an integral systematic scientific worldview using knowledge in the field of history and the philosophy of science		BC-2

Willingness to participate in the work of Russian and international research teams in solving scientific and educational problems	BC-3
readiness to use modern methods and technologies of scientific communication in the state and foreign languages, including readiness for communication in oral and written forms in Russian and foreign languages for solving problems of professional activity, possession of foreign language communicative competence in the official business, academic, scientific, social and cultural, everyday-household spheres of foreign language communication	BC-4
Ability to plan and solve the problems of their own professional and personal development	BC-5

**professional competences:**

<i>Профиль «Экология»</i>	
Own modern scientific-subject area of knowledge in the direction of the program and be able to use it for scientific, practical and pedagogical purposes;	<b>PC-1</b>
Be able to diagnose problems of nature protection, assess the impact of planned facilities or other forms of economic activity and develop practical recommendations for nature protection and sustainable development.	<b>PC-2</b>
Be able to analyze and assess the impact of the environment on human health and life;	<b>PC-3</b>
Be able to organize and manage research, research and production, expert-analytical work and pedagogical activities using advanced knowledge in the field of training.	<b>PC-4</b>

As a result of the student's research training, professional competencies are formed and, following the practice, the graduate student should demonstrate the following results:

**Have an idea about:**

- the current state of science, the main directions of scientific research, priorities;
- the procedure for implementing the results of research and development.

**To know:**

- principles of work of modern scientific equipment when conducting research;
- methods of searching literary sources for the developed, patent search;
- research methods and experimental work;
- methods of analysis and processing of experimental data;
- information technology in scientific research, software products related to the professional sphere;
- requirements for the design of scientific and technical documentation.

**Be able to:**

- to formulate the goals and objectives of scientific research; select and justify research methods;
- to work on modern scientific equipment when conducting research;
- prepare the results of scientific research (report, scientific article, abstracts of reports).

**Possess skills:**

- work on modern scientific equipment in the conduct of scientific research;
- work with application software necessary for conducting research and development in the professional field;

- analysis, systematization and synthesis of scientific and technical information on the topic of research;
- analysis of the reliability of the results;
- analysis of the scientific and practical significance of the research, as well as the technical and economic efficiency of the development;
- speeches with presentations and reports at conferences and academic seminars

## **7. Structure and content of training activities.**

### **Stage 1 (preparatory):**

An installation lecture is held where graduate students are introduced to the goals, objectives and content of research practice. In addition, graduate students receive advice on documentation. An individual practical task is made with a practice leader (supervisor).

### **Stage 2 (main):**

1. Preparation and discussion of the projects of all the heads of the final qualifying work (PhD thesis).

2. Preparation of a list of references on the subject of the thesis;

3. Preparation of the material for writing the introduction and the first chapter of the thesis

**At the third (final) stage**, summing up the practice is provided. Graduate students summarize their research experience in reports and reports. Teachers analyze the activities of graduate students, note the difficulties they have encountered and the most successful solutions to the tasks set during the course of the classes. The overall assessment of the practice consists of the degree of participation of the graduate student in the scientific life of the department and the university, the level of research on the thesis and documentation.

## **8. Educational, research and production technologies used in practice**

In the process of passing the research training the following educational technologies are used:

- contact work of the student with the teacher, consisting in obtaining an individual task, passing safety instructions, receiving advice on practical work, filling out current and reporting documentation, and protecting the practice report;

- other forms of educational work (educational activities), which include the main activity of the student in the implementation of sections of training in accordance with the individual task, recommended methods and sources of literature, aimed at the development of certain professional skills or professional experience provided program of practice, as well as filling out current and reporting documentation, and preparing for the defense of the internship report.

In the process of the training the following research technologies are used:

- mastering the students' methods of information analysis and interpretation of the results of research activities;

- performance of written analytical and calculation tasks within the framework of the training with the use of recommended information sources;

- the use of various computer software products for graphic, analytical and / or industrial purposes (depending on the place of practice and the specifics of the task);

- the use of various electronic library and legal systems by students, etc.

## **9. Educational and methodological support of educational practice**

The independent work of the graduate student is carried out in accordance with the individual plan, developed by the graduate student and supervisor, approved in accordance with the schedule of the educational process by the corresponding department.

Graduate students in their work use sources on the subject of their scientific research. At the same time, the postgraduate student is obliged to familiarize himself with the works on the topic of his research recommended by his supervisor, scientists working and working in the university, as well as other scientific and educational organizations representing the main law schools of the country. It is mandatory for a graduate student to familiarize himself with the work on his research topic published in international journals available through international (including electronic) library systems, which the University provides access to.

A graduate student conducts research independently, avoiding plagiarism, and also minimizing the verbatim borrowing of his previously published works.

Research activities involve familiarity with the work of dissertation councils: the study of regulatory materials governing their activities; clarification of the duties of the chairman of the dissertation council, his deputy and academic secretary of the dissertation council; familiarization with the rules of registration, submission to the protection and protection of dissertations.

### *Основная литература:*

1. О порядке присуждения ученых степеней: Постановление Правительства РФ от 24.09.2013 г. №842 // Официальный интернет-портал правовой информации <http://www.pravo.gov.ru>, 01.10.2013
2. ГОСТ 7.0.11-2011 Диссертация и автореферат диссертации. Структура и правила оформления. Режим доступа: <http://protect.gost.ru/document.aspx?control=7&id=1> 79727.
3. Сайт ВАК Минобрнауки РФ <http://vak.ed.gov.ru/>  
Дополнительная литература
4. Литература, соответствующая направлению проводимого исследования.
5. R (Chandra) Chandrasekhar How to Write a Thesis:A Working Guide. The University of Western Australia, 2008, [http://www.student.uwa.edu.au/\\_data/assets/pdf\\_file/0007/1919239/How-to-write-a-thesis-A-working-guide.pdf](http://www.student.uwa.edu.au/_data/assets/pdf_file/0007/1919239/How-to-write-a-thesis-A-working-guide.pdf)
6. Stefan Ruger How to write a good PhD thesis and survive the viva The Open University, UK, 2016 <http://people.kmi.open.ac.uk/stefan/thesis-writing.pdf>

### **Resources information and telecommunications network "Internet":**

1. EBS PFUR and third-party EBS, to which university students have access on the basis of concluded contracts:

- Electronic library system RUDN - ELS RUDN <http://lib.rudn.ru/MegaPro/Web>
- EBS "University Library Online" <http://www.biblioclub.ru>
- EBS Yurayt <http://www.biblio-online.ru>
- EBS "Student Consultant" www.studentlibrary.ru- ЭБС «Лань» <http://e.lanbook.com/>

### **2. Databases and search engines:**

- electronic fund of legal and regulatory and technical documentation <http://docs.cntd.ru/>
- Yandex search engine <https://www.yandex.ru/>
- Google search engine <https://www.google.com/>
- reference database SCOPUS <http://www.elsevierscience.ru/products/scopus/>

### **Software:**

1. Specialized software for the practice and the formation of the reporting documentation to students: Office 365

## **10. 10. Material and technical support of research training**

Specially equipped classrooms and a computer classroom with workplaces providing Internet access, as well as multimedia equipment are used.

The implementation of the practice program is ensured by the access of each graduate student to information resources — the department library, library of the RUDN University and the Internet network resources. For the use of ICT in the educational process there is software that allows you to search for information on the Internet, systematizing, analyzing and presenting information, exporting information to digital media.

Residential premises comply with applicable sanitary and fire regulations, as well as safety requirements.

### **7. Forms of certification of the research training**

In the course of the internship, the teacher carries out ongoing monitoring of the students' fulfillment of the practical tasks. According to the results of the practice, intermediate certification was provided in the form of a test with an assessment (according to the results of the protection of the practice report).

## **13. Fund of evaluation tools for the certification of students**

The fund, formed to conduct ongoing performance monitoring and intermediate certification of students in practice for obtaining primary professional skills includes:

- a list of competencies generated in the process of training;
- description of indicators and criteria for assessing competencies, description of assessment scales;
- materials necessary for the assessment of knowledge, skills, abilities and (or) experience, characterizing the level of formation of competencies;
- methodological materials defining the procedures for evaluating knowledge, skills, abilities and (or) experience, characterizing the level of formation of the competencies.

Forms of intermediate certification (on the basis of practice): Monitoring the progress of research practice is carried out by weekly consultations of a graduate student with a supervisor; verification by the laboratory supervisor; the performance of graduate students on the subject of research in the framework of a scientific seminar, performance at scientific conferences; presentation of information on the course of internship at the meetings of the department.

After completing the research training, a graduate student writes a report that sets out all the results obtained in accordance with the assignment. The results of the training are summarized by a graduate student in a report on the passage of research training.

The internship report should contain: a title page; an introduction where the relevance of the training topic is shown; literature review based on the results of the study of literary sources, reflecting the well-known theoretical data and experimental results on the chosen topic conclusions; list of research; experimental technique; discussion of the results of the literature; table of contents.

The volume of the report is determined by the peculiarities of the individual postgraduate practice plan. At the end of the research practice, the graduate student passes the test (protects the report) with a differentiated assessment at a conference in the presence of teachers and leading members of the departments. In assessing the results of the work, the characteristics given by the practice manager are taken into account.



When defending a research training, a graduate student makes a report of no more than 10 minutes in which he presents the results obtained, gives their interpretation and reads the conclusions. Then the graduate student answers questions on the subject of work.

A graduate student who has not fulfilled the practice program, has received a negative review of work or an unsatisfactory assessment in defending a report is sent again to practice and is not allowed to defend a scientific report.

Criterion for assessing the knowledge of graduate students: According to the results of research, the work of a graduate student is differentiated: - excellent, - good, - satisfactory.

№	Controlled competence code	Supervised disciplines units	Name of the estimated means
	BC-1, BC-5	Introduction Safety Instructions. Conversation with the supervisor: drawing up a research plan.	Interview. control of results
	BC-2, BC-4	Performing experiments that correspond to the chosen profile of the graduate school (if necessary), conducting analytical work. Processing and processing of the results	Report. Scientific publication (if exists).
	GPC-1, BC-3	Setting goals and objectives of the study. Review and analysis of information on the research topic. Theoretical and experimental research	Interview. control of results
	GPC-1	1. Setting goals and objectives of the study. Review and analysis of information on the research topic. Theoretical and experimental studies 2. Processing of experimental data, analysis of results. preparation of the report and the scientific publication	Report. Scientific publication (if exists).
	PC-1, PC-2, PC-3 PC-4.	1. Setting goals and objectives of the study. Review and analysis of information on the research topic. Theoretical and experimental studies 2. Processing of experimental data, analysis of results. Preparation of the report and scientific publication	Interview. Protocols laboratory classes (if available), the results of calculations, the conclusions.
	PC -1, PC -2, PC -3, PC -4.	1. Performing experiments that correspond to the selected profile of graduate school	Report. Scientific publication (if exists).
	PC -1, PC -2, PC -3, PC -4.	2. Processing and processing of the results	Report. Scientific publication

#### Planned results of the passage of scientific research training

Planned learning outcomes	Evaluation tools	Criteria for assessing learning outcomes	Indicators of evaluation of learning outcomes (fail/ pass)	
Know: scientific sources on the topic of research being developed	Research Program Typical Tasks Report	Bibliography on the topic of research	The bibliography on the research topic is not complete	The bibliography on the topic of the study is complete

Be able to: apply basic knowledge when choosing methods of research design and implementation of complex interdisciplinary research	Research program Typical tasks Report	Representation of various research methods in the research program	Fragmentary ideas about research methods	Formed, but containing separate gaps ideas about the methods of research activities
		Completeness of characteristics of methods	Demonstrates fragmentary knowledge of methods.	Demonstrates knowledge of most of the characteristics of the methods.
Owning: planning technologies of various areas of professional activity (research, promotion, search)	Research Program Typical Tasks Report	Possession of technology planning various areas of professional activity (research, promotion, search, etc.)	Owens individual areas of professional planning	Owens areas of professional planning
Possess: stylistic features of presenting the results of scientific activities in oral and written form in the state and foreign languages	Research program Typical tasks Report	Quality of graphical tools for presenting research results	Graphic tools for presenting research results are slightly understandable	Graphic tools for presenting research results are clear and consistent.
		The quality of prepared scientific publications.	General, not formed ideas about the requirements for the content and rules of manuscripts for publication in peer-reviewed scientific journals	Formed ideas about the requirements for the content and rules of manuscripts, the presence of repeated experience of publications in peer-reviewed scientific publications
Be able to: follow the basic standards adopted in scientific communication in the state and foreign languages	Research program Typical tasks Report	Ability to conduct a scientific discussion in accordance with ethical standards, laws of logic and rules of reasoning	No experience speaking at international conferences and publishing articles.	There is experience speaking at international conferences and publishing articles.
To be able to: use the methods of processing the obtained empirical data and interpret them in a scientific study	Research program Typical tasks Report	Quality of processing experimental data	Fragmentary ability to select and process experimental and theoretical results	Formed ability to select and process experimental and theoretical results
To be able to: independently put forward working hypotheses and develop research programs	Research program Typical tasks Report	The quality of the formulation of goals, objectives and research hypotheses.	The goals, objectives and hypothesis of the study are not clearly formulated.	The goals, objectives and hypothesis of the study are clearly formulated.
		Accuracy and accuracy in the analysis of research data	Analysis of the research data was conducted with gross violations.	The analysis of the research data was carried out carefully, the scientific results obtained on the basis of the analysis can be considered reliable
Be able to: conduct an assessment of the scientific and practical significance of the results of the research	Research program Typical tasks Report	Analysis of the results obtained in the wording of the conclusions	Fragmentary application of skills for analyzing the results obtained and formulating conclusions	In general, successful and systematic application of the skills of analyzing the results obtained and formulating conclusions
Possess: the ability to systematize and synthesize various types of information in the framework of scientific research	Research program Typical tasks Report	Generalization of the results obtained in the scientific and qualification work	The results of the research work used fragmentary in the preparation of the thesis	The results of the research work are fully and competently used in the preparation of the thesis
		Skills of collective discussion of work plans, scientific results	Non-systematic use of skills for collective discussion of work	Successful and systematic application of the skills of collective

		obtained, coordination of interests of the parties in a teamwork discussion	plans, scientific results obtained, lack of experience in coordinating the interests of the parties in a team	discussion of work plans, scientific results obtained, coordination of interests in the team
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**Typical tasks:**

- 1) to formulate the purpose, objectives and object of scientific research;
- 2) to formulate a scientific research problem;
- 3) to submit scientific sources on the research topic being developed;
- 4) to justify the chosen direction of research and to select the means and methods necessary to achieve the task;
- 5) to substantiate the method of processing and interpreting the experimental results and the comparison of the results of modeling;
- 6) choose the necessary experimental and theoretical methods for the conducting of research;
- 7) to formulate the requirements for the design of the results of scientific research;
- 8) present the methods of analysis and processing of research data;
- 9) to present the methods of empirical data processing;
- 10) to make an oral presentation at a scientific seminar, conference, school;
- 11) to prepare a presentation on the results of scientific research;
- 12) to prepare a bibliographical review of the main scientific results in the form of essay;
- 13) to develop conclusions and proposals for the inclusion of research materials in scientific qualification work;
- 14) to compare the obtained results of the study of the object of development with the existing domestic / foreign counterparts;
- 15) and others.

When grading is taken into account the following indicators:

- the degree of implementation of tasks stipulated by the program of practice and the individual plan of the graduate student;
- the level of professional training and mastering the competencies established by the Federal State Educational Standard of Higher Education in the relevant field of study;
- the quality of the report on the internship.

Criteria for evaluating the results of the research training:

- 1) possession of a scientific research apparatus;
- 2) a clear concept of work;
- 3) the presence of a detailed description of the research methodology, the degree of knowledge of the research object;
- 4) scientific style of presentation of the problem;
- 5) the ability to work with sources of different types (completeness of the source base, representativeness, assessment of their reliability, etc.);
- 6) the amount of research work carried out;
- 7) the ability to competently, affordably, professionally state and present the results of the conducted research work;
- 8) literacy of the text of the report;

The assessment is “passed” to a graduate student who completed the entire planned amount of work on time and at a high level in accordance with the program of practice, showed independence, creativity and appropriate professional training, showed mastery of theoretical knowledge and practical skills. The assessment is also credited to the graduate student who fully complied with the program planned for the preparation period, but made minor methodological miscalculations with a general good level of professional training.

The grade "failed" is put to the graduate student with partial fulfillment of the planned amount of practice and making mistakes and errors of a methodological nature.

**Developers**

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