

*Federal state autonomous educational institution of higher professional education  
"People's Friendship University of Russia"*

**Ecological faculty**

**Scientific researches program**

**Recommended for the direction**

05.06.01 "Earth sciences"

**Profile: Ecology: Modern environmental studies**

Graduate qualification (degree):

Researcher. Research teacher

Moscow, 2017

## **1. The purpose of the block "Scientific Research"**

The purpose of the block "Scientific research" (direction of training 05.06.01 - Earth Sciences, preparation profiles - Ecology,) preparation and defense of the scientific qualification work (dissertation) and preparation for the defense of the thesis for the degree of candidate of sciences based on the results of individual research work and (or) as part of the creative team.

## **2. Tasks of the Scientific Research block**

The main tasks of the Scientific Research block are aimed at:

- the formation and development of the skills of scientific research, the ability to independently formulate and solve problems arising in the course of research activities;
- development of creative abilities and professional qualities of the personality of the graduate student;
- the formation of a professional research thinking of a graduate student;
- mastering the modern methods of collecting, processing and interpreting the experimental and empirical data obtained;
- the formation of the ability to work effectively as part of a scientific team;
- approbation of the results of scientific research;
- preparation of scientific articles, abstracts, final scientific and qualification work (in the subsequent dissertation for the degree of candidate of science).

## **3. The place of the research unit in the structure of the Education ProgramO**

To carry out research work, graduate students should have knowledge of the following fundamental disciplines (Mathematics, Physics, Chemistry, Computer Science, Geology, Soil Science, Geography, Biology, Ecology). ) and applied disciplines in the specialty "Ecology" in the volume of the program of higher professional education and the disciplines studied in the process of mastering the program of postgraduate study.

The knowledge and skills acquired by graduate students in the implementation of the "Scientific Research" block are used by them in writing scientific qualification work (thesis). The block "Research" is mandatory for the state final certification and qualification "Researcher. Teacher Research.

## **4. Forms of the "Research" block proceedings**

The block "Research" provides several forms of research activities (experimental, experimental, analytical, methodical, etc.) and includes:

- the study of the theoretical foundations of the methodology for carrying out scientific research, planning and organizing a scientific experiment, processing scientific data, conducting educational research works;
- presentation of reports on the topic of research at scientific conferences, seminars;
- participation in competitions of research works, grants, competitions in the framework of the scientific direction of the postgraduate program;
- participation of graduate students in the implementation of the state budgetary research of graduating departments; Participation in research and educational internships in the direction of training.

The list of research forms for graduate students can be specified and supplemented depending on the specifics of the research topic.

## **5. Place and time of the "Research" block**

The research work of graduate students is carried out during the entire time of study according to an individual plan and study schedule.

The base for scientific research is the RUDN University. The organizer of the practice is the corresponding department, where the PhD student is assigned. If necessary, a graduate student can carry out scientific research in other departments and laboratories with similar topics, especially if the scientific interests of the department coincide with that of a graduate student. During the period of research work, graduate students are subject to all internal regulations and safety procedures established in departments and other departments of the university.

## **6 Management of postgraduate research activities**

### **6.1. The management of research activities of graduate students is organized in the graduating departments.**

The management, scientific and methodological advice and monitoring of the implementation of the scientific research of the graduate student is carried out by the scientific adviser appointed by the order of the rector based on the decision of the Academic Council of the Ecological Faculty of the RUDN University and monitored by the department.

The supervisor appointed by the graduate student should:

- have a degree of a doctor or candidate of science in accordance with the requirements established by the Federal State Educational Standard of Higher Education in the relevant field of study (including assigned abroad and recognized in the Russian Federation);
- carry out independent research activities on the focus (profile) of training;
- have publications on the results of research activities in leading domestic and foreign peer-reviewed scientific journals and publications;
- carry out approbation of the results of their scientific activities at national and international conferences.

The procedure for the appointment and responsibilities of the scientific supervisors of graduate students are governed by the Regulations on the scientific supervisor of the graduate student.

### **6.2. The subject of scientific research of a graduate student is approved by the Academic Council of the Ecological Faculty of the RUDN University.**

A postgraduate research should:

- Comply with the main issues of the scientific specialty for which the scientific and qualification work is defended (dissertation);
- be relevant, contain scientific novelty and practical significance;
- based on modern theoretical, methodological and technological achievements of domestic and foreign science and practice;
- use modern research techniques;
- based on modern methods of processing and interpreting data using computer technology;
- contain theoretical (methodical, practical) sections, consistent with the scientific provisions defended in the master's thesis.

## **7. Student competencies generated as a result of the tasks of the “Scientific research” block**

The implementation of research work is aimed at the formation of the following 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
Ability to plan and solve the problems of their own professional and personal development	BC-5

### **Профессиональные компетенции:**

<b>Профиль «Экология»</b>	
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 tasks of the Scientific Research block, the graduate student should:

**Know:**

- the main achievements and development trends of the relevant scientific field and its relationship with other sciences;
- the specifics of research activities in the relevant professional field using modern research methods and information and communication technologies;
- methods of analyzing and processing information using modern software and computing tools, according to the topic of scientific research;

**Be able to:**

- issue, submit and report the results of the work performed;
- to formulate goals, objectives of research, choose methods and means of solving problems;
- apply modern theoretical and experimental research methods, according to the chosen topic;
- organize and conduct experimental studies;
- analyze the results of theoretical and experimental studies; - make recommendations for improving the methods of analysis in a given area;
- prepare scientific publications and applications for inventions.

**Own:**

- skills of planning and processing the results of a scientific experiment;
- skills of preparing and presenting a report or a detailed presentation on topics related to the direction of scientific research;
- skills of working with global information resources (search sites, sites of foreign universities and

professional communities, electronic encyclopedias, etc.);

- skills in the scientific team.

The main features of the development of the generated competencies as a result of the implementation of the Program of the block "Scientific research"

Compliance of competence levels with the planned learning outcomes and the criteria for their assessment

Stage (level) of the development of competence	The main features of the development of competence (level description)			
	unsatisfactory	satisfactorily	good	excellent
Minimal	Is not oriented in terminology and content	Able to highlight the main ideas of the study, works with critical literature	Owens basic skills in working with sources and critical literature.	Able to give your own critical assessment of the material being studied.
	does not highlight the main ideas	Able to show the main idea in the development	Able to present a key problem in its connection with other processes.	Can relate main ideas to modern problems.
Basic	poorly oriented in terminology and content	Owens techniques of search and systematization, but is not able to state freely the material	He freely presents the material, but does not demonstrate the skills of comparing basic ideas and conceptions	Able to compare concepts, substantiated material
	highlights the main ideas, but sees no problems	It identifies a specific problem, however, it oversimplifies it.	Able to highlight and compare concepts,	Argumentally compares concepts for a given topic.
Advanced	oriented in terminology and content	Understands the basic idea in general, but poorly connects it with the existing problems.	He sees the sources of modern problems in a given area of analysis, owns approaches to solving them	Able to competently justify their own position regarding the solution of modern problems in a given area
	highlights the main ideas, but does not see them in development	Can understand the practical purpose of the main idea, but finds it difficult to identify its foundations.	Freely oriented in a given area of analysis. Understands its foundation and is able to highlight the practical importance of a given area.	Freely oriented in a given area of analysis. Understands its foundation and is able to highlight the practical importance of a given area.

## 8. The structure and content of the block "Research"

The total complexity of the unit "Scientific Research" during the entire period of training is 90 credits  
3240 hours.

The choice of subject and subject of scientific research is coordinated with the supervisor.

№	Credits, hours 90 3E, 3240	Stages	Types of work, including the independent work of graduate students and labor intensity (in hours)	Forms of control	competencies
	30. 1030	1 <sup>st</sup> year			
1		Definition and approval of research topic	60	Extract from the minutes of the meeting of the Scientist council of the faculty	
		Planning the study. The formulation of the goals and objectives of the study	300	Individual plan	GPC-1 BC-2
		Review and theoretical analysis of scientific research literature	400		BC-1 PC 1-4
		Selection of research methodology	108		GPC-1
		Definition of material for publications Determination of types of testing approbation	150		BC-3
		Scientific report	12	Extract from the meeting of the department of certification	PCK-5
	2 <sup>nd</sup> year				
3	30. 1030	Work on the implementation of the theoretical part of the study	108	Preparation of the thesis review	GPCK-1 BC-1-5
		Practical study of research methods the subject of research	220	Individual plan	BC-1, 3, 4 PC 1-4 BC-1, 3, 4 PC 1-4
		Execution of the experimental part Research (if available) and Analysis of experimental data on the results of scientific research			
		Preparation of publications	216	Publications	PC-3, 4
		Approbation of the study	324	Conference programs, certificates, certificates of implementation, etc.	PC-3 PC-4
		Research Report	162	Extract from the meeting of the department of certification	BC-5
	3 <sup>ed</sup> year 30, 1180				
		Preparation of the plan of scientific and qualification work	36	Plan	BC-1, BC-2

		Work on the preparation of a dissertation	108	Presentation of the manuscript to the supervisor, review of the leading organization	BC-4
		Presentation of the thesis text for discussion at the department	108	Extract from the meeting of the department of certification	BC-4
		author's abstract $\text{зкызфкфешшт}$	586	Presentation of the abstract to the supervisor	BC-4
		Preparation and submission of the thesis for defense	180	Presentation, handout, report outline	BC-4 BC-5
		Report	162	Report	BC-5

The specific sections of the Scientific Research block and the terms for their implementation (as part of the curriculum) are determined on the basis of the capabilities and technical equipment of the RUDN educational classrooms, the university's work schedule, research topics and methods. Agreed supervisor and approved by the department.

The most significant are the following research results:

- publications prepared independently in foreign journals (especially in the former SCOPUS and WoS);
- publications in refereed domestic journals (HAC and RISI)
- performance with the report at scientific conference (symposium) not below the Russian level;
- received patents (or documents confirming their registration);
- documents confirming achievements in scientific activities: letters, letters, prizes, awards, etc .;
- Participation in the implementation of any type of research and development work, including: contractual; state budget; work in student design offices; in intercollegiate student associations.

A negative conclusion can be made in the following cases:

- the graduate student did not provide the necessary reporting materials within the prescribed period without a valid reason;
- implementation of the stage of research in an incomplete volume at the conclusion of the head;
- lack of significant scientific results on the conclusion of the attestation commission.

## 9. Research technologies,

1. Multimedia technology.
2. Technologies corresponding to the direction of research and the specifics of the work performed (field studies, laboratory studies, GIS, statistical analysis, mathematical modeling, etc.). The maximum possible graduate student mastering of all information technologies is supposed. These technologies are determined by the direction of training and the research topic chosen by the graduate student, in consultation with the supervisor.
3. The main and additional literature is determined by the supervisor individually for each graduate student, depending on the subject matter of the thesis, and is also formulated by the graduate student as a result of research.

## **10. Teaching and methodological support of students' independent work during the period of scientific and qualification work**

The educational and methodological support for the independent work of a graduate student during the period of scientific and qualification work is provided by the supervisor and leading teachers of the graduating department of the Faculty of Ecology.

Performance of work takes place at regular consultations. All graduate students at the time of the scientific and qualification work are provided

– workplace equipped PC with unlimited Internet access;

A large library collection, complete with printed and electronic publications of basic textbooks; the fund of additional literature, including official, reference and bibliographic and specialized periodicals;  
– access to electronic library systems.

## **11. Forms of intermediate certification (according to the results of the block "Scientific research")**

Intermediate certification is carried out twice a year (throughout the entire period of training for the graduate student training program) according to the results of research activities in the form of a differentiated test when the graduate student provides a report on the implementation of the research.

At the end of the research, the graduate student should prepare and at the meeting of the scientific seminar to test the scientific and qualification work (dissertation) in the form of a presentation.

The result of the research activity is the presentation of a scientific report on the main results of the prepared scientific and qualification work.

A graduate student, whose research activity is considered unsatisfactory, is considered to have failed to complete the curriculum.

By decision of the supervisor, agreed with the head of the graduate school, he can be assigned to repeat the block.

Graduate students who have not completed the "Research" block of programs without good reason or have not submitted a research report within the specified time frame are not certified for the current period of study. Graduate students who are not certified by the results of scientific research are not allowed to take the state exam and defend the thesis.

## **12. Reporting documents on the block "Scientific research"**

At the beginning of the work a graduate student draws up and submits an individual plan, and an extract from the minutes of the meeting of the Faculty Academic Council on the approval of the research topic.

By the time of the intermediate certification (according to the curriculum), the graduate student submits the following reporting documents:

Report on the implementation of research activities. In the report, a graduate student systematizes and summarizes the work done.

The content of the report should include the following structural elements:

- introduction, which indicates:
- purpose, location, start date and duration of the research period; - a list of work performed and tasks for the past period; - the main results of the study:
- review of literature on the research topic;
- description of the tasks solved in the process of research; - results of the analysis of the work performed, etc.
- a list of references used.



The report on the research activities of the graduate student should be presented at the meeting of the department. The report may include: the results of data processing, the output of articles, theses of reports published for the current period, the texts of reports and speeches of graduate students at scientific conferences, certificates, diplomas, certificates for participation in scientific forums, acts of implementation, patents on research topics and etc.

### 13. **Logistical and informational support of the Scientific Research»**

In carrying out research and development, material, technical and information support is used that is located at the Faculty of Ecology of the RUDN University, including:

- classrooms for classes (lectures, practical, laboratory, etc.)
- multimedia and office equipment (projectors, screens, computers, printers, etc.);

#### **Developers**

Head of profile «Geoecology»



Stanis Elena V.

Head of profile «Ecology»



Rodionova Olga. M.

Head of program



Chernykch Natalia A.

