

Federal State Autonomous Educational Institution of Higher Education  
"Peoples' Friendship University of Russia"

Faculty of ecology  
Recommended by ISSC

THE WORKING PROGRAM OF THE DISCIPLINE

**Title of the discipline** " Methodology of Scientific Research " \_\_\_\_\_

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**Recommended for the direction of training / specialty**

05.06.01 EARTH SCIENCES

*(указываются код и наименование направления подготовки/специальности)*

**Focus of the program (profile)**

Ecology: Modern environmental studies

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*(наименование образовательной программы в соответствии с направленностью (профилем))*

### 1. Objectives and tasks of the discipline:

The objectives of the development of the discipline "Methodology of Scientific Research" in accordance with the overall objectives of the basic professional educational programs of post-graduate professional education (graduate school) (hereinafter - the educational program of postgraduate professional education) are:

- Assimilation of graduate PhD students knowledge about the methods of scientific research in areas of earth sciences;
- Formation of post-graduate scientific understanding of the methods of collection, processing, analysis and reporting of economic information in scientific research.

### 2. Place the discipline in the structure of the educational program of postgraduate education:

This discipline refers to the section of compulsory subjects (sub-discipline of choice postgraduate) educational component of the educational program of postgraduate professional education in the specialty 05.06.01 «Ecology: Modern environmental studies.

The discipline "Methodology of scientific research" shows the evolution of the fundamental conceptual and theoretical assumptions and hypotheses presented in the classical and contemporary works of domestic and foreign scientists specializing in the field of economic research methodology.

For the study of the discipline required "input" of knowledge and skills obtained during the training program or specialty undergraduate, graduate (natural science sections. The development of this discipline as a necessary antecedent to write a doctoral dissertation.

The discipline belongs to the compulsory disciplines of the variable part of block 1. Table 1 shows the previous and subsequent disciplines aimed at the formation of discipline competencies in accordance with the competence matrix of EP HE.

Table No. 1

**Prior and subsequent disciplines aimed at the formation of competencies**

№ п/п	Code and name of competence	Preceding disciplines	Subsequent disciplines (groups of disciplines)
Basic competencies			
		mathematics, logic, philosophy, psychology, sociology, probability theory, statistics	Preparation of thesis
		logic, philosophy, psychology, sociology, foreign language	
General professional competencies			
		mathematics, probability theory, statistics, general ecology	Preparation of thesis
		physics, chemistry, biology, ecology, the doctrine of the atmosphere; The doctrine of the biosphere;	

### 3. Requirements for the results of the development of the discipline:

Education on the subject aimed at the formation of the following competencies:

#### **general professional competence**

- the ability to independently carry out research activities in the relevant professional field using

- modern research methods and information and communication technologies GPC-1;
- readiness for teaching activities in the main educational programs of higher education GPC-2

### Universal competences

BC-1 - the ability for critical analysis and evaluation of current scientific achievements, generating new ideas in solving the research and practical problems, including interdisciplinary fields

BC-2 - the ability to design and implement integrated research, including interdisciplinary, a holistic system of scientific outlook on the knowledge of the history and philosophy of science

BC-4 - a willingness to use modern methods of scientific communication and technology at the state and foreign languages

BC-5 - the ability to plan and solve problems of their own professional and personal development

### As a result of studying the discipline PhD student must:

Know:

- basic methodological approaches to research;
- Main types of information sources for research;

To be able to:

- develop and apply methodological bases of research of forms of economic relations, the mechanisms of their modifications and transformation;
- To reveal the possibility of knowing the nature, form, mechanism and role of economic relations and processes in the essential and functional aspects;

Own - contemporary conceptual-categorical apparatus and methods of the latest economic research.

research.

### 4. The volume of disciplines and types of training work

Credit system 3 credits, 108 hours.

Type of study	Hours	Semesters			
Class hours (total)	60	1	2		
<i>Including:</i>	-		-	-	-
Lectures	26	6	20		
Practical training	26	6	20		
Seminars					
Laboratory works					
Independent work (total)	29	15	14		
Credit system	час	108	36	72	
	зач. ед.	4	1	2	

### 5. Contents

#### 5.1. Contents sections

№ п/п	Title of discipline Section	In This section	Competence, forming section (section) discipline
1	Introduction	Modern science. Why do science. Summary determinant owls belt Sciences.	ОПК-1; ОПК-2;

		Matches in science. Own scientific work.	YK-1; YK-2; YK-3; YK-5
2	Information and Disinformation	Information and Disinformation "Fake News" and Disinformation 7 ways to find out the real facts from fake news How to recognize real and fake information	ОПК-1; YK-1; YK-2; YK-3; YK-5
3	GIS and Remote sensing	Application of Geo-Information Systems as a research method. Remote sensing. Types. Application in for solving environmental problems	ОПК-1; YK-1; YK-2; YK-3; YK-5
4	Environmental measurements and modeling	EPA models. Environmental and economic assessment of landfill gas utilization technologies using LandGem software and IPCC WASTE MODEL. Data Science for Environmental Modeling and Renewable Energy. Modeling tools for environmental engineers and scientists. Vensim software	ОПК-1; ОПК-2; YK-1; YK-2; YK-3; YK-5
5	Life Cycle Assessment	Life Cycle Assessment Software	ОПК-1; YK-1; YK-2; YK-3; YK-5
6	Academic ethics	Academic ethics. Publications. Scientometrics. Plagiarism. Authors' conflicts of interest.	ОПК-1; ОПК-2; YK-1; YK-2; YK-3; YK-5
7	Dissertation writing	Classifications, structural sections of the thesis, conclusions (booklet and informative), abbreviations.	ОПК-1; YK-1; YK-2; YK-3; YK-5
8	Preparing for defense	Pre-defense, basic questions on defense,	
9	Publications on the topic of the dissertation	Primary requirements. Abstract.	

## 5.2. Sections of disciplines and occupations

№ п/п	Title of discipline Section	lection.	Practical training	Independent work	Total
1	Introduction	2	2	2	6
2	Information and Disinformation	2	2	2	6
3	GIS and Remote sensing	6	6	8	20
4	Environmental measurements and modeling	4	4	4	12
5	Life Cycle Assessment	2	2	5	9
6	Academic ethics	2	2	4	8
7	Dissertation writing	2	2	4	8
8	Preparing for defense	4	4	4	12
9	Publications on the topic of the dissertation	2	2	4	8
total:		26	26	37	108

## 6. Practical trainings (seminars)

№	№ discipline	Seminar focus	hours
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п/п	section		
1	1	Introduction	2
2	2	Information and Disinformation	2
3	3	GIS and Remote sensing - introduction to remote sensing - vegetation indices - spatial analysis in GIS	2 2 2
4	4	Environmental measurements and modeling	4
5	5	Life Cycle Assessment	2
6	6	Academic ethics	2
7	7	Dissertation writing	2
8	8	Preparing for defense	4
9	9	Publications on the topic of the dissertation	2

### 8. Material and technical support of the discipline:

The discipline is provided by classrooms to demonstrate presentations of individual sections of the course and computer classes to perform practical tasks. Projector

### 9. Information support of the discipline

database, information and search engines

[www.e-library.ru](http://www.e-library.ru)

[www.science-direct.com](http://www.science-direct.com)

[www.google.ru](http://www.google.ru)

### 10. The educational-methodical and informational support of the discipline:

<p>1) Luis M. Camarinha-Matos SCIENTIFIC RESEARCH. METHODOLOGIES AND TECHNIQUES.</p> <p>2) Anol Bhattacharjee Social Science Research: Principles, Methods, and Practices University of South Florida Scholar Commons, 2012, 159 p</p> <p>3) Иванова Т.Б. Methodology of Scientific Research [Текст/электронный ресурс] = Методология научного исследования : Education and Methodical Complex / Т.Б. Иванова. - Книга на английском языке; Электронные текстовые данные. - М. : PFUR, 2013. - 117 p. - ISBN 978-5-209-05048-3 : 167.79.</p> <p>4) The Scientific Method. by Science Made Simple</p> <p>5) Conducting a debate</p> <p>6) SCIENTIFIC DEBATE</p> <p>б) additional literature</p> <p>1) Марьянович А.Т. ЭРПАТОЛОГИЯ или как избежать наиболее неприятных ошибок при подготовке диссертации. Изд. 2-е, перераб. и доп.-М.: Вузовская книга, 1999. — 164 с.</p> <p>2) Lakatos, Imre The methodology of scientific research programmes The Pitt Building, University of Cambridge 1989, 257 p</p> <p>3) The 9 Most Controversial Science Stories in 2009</p> <p>4) Imre Lakatos Criticism and the Methodology of Scientific Research Programmes, 2009</p>	<p>1) <a href="http://www.uninova.pt/cam/teaching/SRMT/SRMTunit2.pdf">http://www.uninova.pt/cam/teaching/SRMT/SRMTunit2.pdf</a></p> <p>2) на портале</p> <p>3 ЭБС РУДН</p> <p>4(<a href="http://www.sciencemadesimple.com/scientific_method.html">http://www.sciencemadesimple.com/scientific_method.html</a>)</p> <p>5) <a href="http://www.edu.gov.mb.ca/k12/cur/socstud/frame_found_sr2/tns/tn-13.pdf">http://www.edu.gov.mb.ca/k12/cur/socstud/frame_found_sr2/tns/tn-13.pdf</a></p> <p>6) <a href="http://www.howell.k12.nj.us/twroot/mms/jlangenberger/914/downloads/newdebate.pdf">http://www.howell.k12.nj.us/twroot/mms/jlangenberger/914/downloads/newdebate.pdf</a></p> <p>Additional</p> <p>1). ЭБС РУДН</p> <p>2) <a href="http://bookre.org/reader?file=654863">http://bookre.org/reader?file=654863</a></p> <p>3) <a href="http://www.foxnews.com/tech/2009/12/28/controversial-science-stories.html">http://www.foxnews.com/tech/2009/12/28/controversial-science-stories.html</a></p> <p>4) <a href="http://www.jstor.org/stable/4544774">http://www.jstor.org/stable/4544774</a></p>
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### 11. Guidelines for the organization of the study of the discipline:

Ongoing performance monitoring is assessed by completing homework and discussing topics in seminars. During the educational process, intermediate certification is carried out. The course ends with classification.

**12. Fund of assessment tools for intermediate certification of students in the discipline (module)**

Materials for assessing the level of mastering the educational material of the discipline "Methodology of scientific research" (evaluation materials), including a list of competencies indicating the stages of their formation, a description of indicators and criteria for evaluating competencies at various stages of their formation, a description of the assessment scales, typical control tasks or other materials necessary to assess knowledge, skills, skills and (or) experience of activity, characterizing the stages of the formation of competencies in the process of mastering the educational program, methodological materials that determine the procedures for assessing knowledge, skills, skills and (or) experience of activities that characterize the stages of the formation of competencies are developed in full and are available for students on the discipline page at TUIS RUDN.

The program has been drawn up in accordance with the requirements of the ES of HE RUDN University.

**Developer:**

Department of Environmental  
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Kapralova D.O.

**Head of the program**

Head of the Department of  
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