

Документ подписан простой электронной подписью  
Информация о владельце:  
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Должность: Ректор  
Дата подписания: 29.04.2026 13:39:34  
Уникальный программный ключ:  
ca953a0120d891083f939673078ef1a989dae18a

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

**Institute of Environmental Engineering**

(educational division (faculty/institute/academy) as programme developer)

## **COURSE SYLLABUS**

**Regulation of natural system quality**

(course title)

Scientific speciality:

**1.5.15 Ecology**

(scientific speciality code and title)

The course instruction is implemented within the PhD programmes:

**Ecology: Modern environmental Studies**

(PhD program title)

### 1. DISCIPLINE (MODULE) GOAL

In-depth study of the theoretical foundations of environmental regulation, practice development and application of environmental standards and modern trends of development of valuation as a tool for environmental management.

### 2. REQUIREMENTS TO PHD-STUDENTS ON FINISHING THE COURSE

As a result of studying the discipline, a postgraduate student should:

Familiarize with the theoretical foundations of systems stability theory;

- Familiarize with the development of environmental regulation system in Russia and abroad, including the presentation of the main areas of standardization and effectiveness;
- Study of foreign experience in the development and practical application of environmental regulations;
- Familiarize with the valuation of risks in the sphere of natural resources, geo-ecology and environmental safety;
- The development of practical competence in the analysis and development of environmental standards;
- Familiarize with the establishment of corporate systems of environmental regulation.

### 3. WORKLOAD OF THE DISCIPLINE AND TYPES OF ACTIVITIES

The overall workload of the discipline « Regulation of Natural System Quality» is 4 credit units (144 academic hours).

Types of activities	Total ac. hrs.	Semesters	
		2	
<i>Classroom activities (total), including:</i>			
including:			
Lectures (LC)	30	30	
Laboratory activities (LA)			
Practical lessons/Seminars (PC)	30	30	
<i>Independent work</i>	48	48	
<i>Intermediate certification (test with assessment/exam)</i>	36	36	
Overall workload	ac. hrs.	<b>144</b>	<b>144</b>
	credits	<b>4</b>	<b>4</b>

### 4. CONTENT OF THE DISCIPLINE

Name of the discipline section	Contents of the section (topic)	Type of study work

Topic 1.	Theoretical basis of assessment and modeling of natural systems sustainability. The concept of sustainability as a basis for creating models of pollution of the environment and use of natural resources. Practical examples of pollution modeling and reflected in these different aspects of the stability properties of natural-systems to anthropogenic influence. The specifics of teaching specific subjects in high school: the evaluation pressures on natural systems	L, S
Topic 2:	Evolution of environmental standards, from the sanitary and hygienic standards for ecosystem evaluation. Comparative analysis of sanitary-hygienic and ecosystem approaches to rationing. Prospects of transformation normation systems. Practical examples.	L, S
Topic 3.	Evolution of environmental regulations, from the rules to the impact of ideas on the best available technologies. Comparative analysis of the impact of standards and valuation tion on the best technologies.	L, S
Topic 4.	Foreign system of environmental standards: the EU quality standards of the atmosphere, hydrosphere, soil and land resources and regulation of anthropogenic-governmental influences on them. Features of the regional legislation.	L, S
Topic 5.	Foreign system of environmental standards: the United States and Canada experience. The specification of atmosphere, hydrosphere, soil and land resources quality and human impacts regulation. Features of the regional legislation.	L, S
Topic 6.	Foreign system of environmental standards: the Chinese experience. quality standards of the atmosphere, hydrosphere, soil and land resources and anthropogenic-governmental influences regulation. Features of the regional legislation.	L, S
Topic 7.	Rationing of tolerable risk . The concept of tolerable risk. The notion of acceptable riskassessment as a basis for the creation of environmental quality standards, environmental impacts, environmental standards, processes and services, product standards.	L, S
Topic 8.	Corporate system of ecological regulation and standardization. Practical examples of corporate environmental standards systems: the experience of Russian and foreign companies. Integrated management systems and specific environmental regulation.	L, S
Topic 9.	The practice of the environmental standards development in Russia. "Weaknesses" and the WHO-possibilities of improvement. The idea of standards harmonization and modern international programs.	L, S
Topic 10.	Modern priorities of anthropogenic load. Priority of environmental issues and the anthropogenic load on the environment reduce. Areas of environmental regulation system development. Russia's international obligations and requirements for rationing system.	L, S

## 5. EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

Room Type	Room Equipment	Specialized educational / laboratory equipment, software and materials for mastering the discipline
Class for Seminars	Room for seminar-type classes, equipped with a set of specialized furniture, board (screen) and technical / multimedia gadgets	Not necessary
Self-Work Class	Room for self-working (can be used for lecture and seminars activities), equipped with a set of specialized furniture, board (screen) and technical / multimedia gadgets and computers with an access to EIPES	Not necessary

## 6. METHODOLOGICAL SUPPORT AND LEARNING MATERIALS

### *Main readings:*

- 1) Stability of natural systems - Theory and practice Article (PDF Available) in Miscellanea Geographica 13:11-19 · January 2008  
[https://www.researchgate.net/publication/276418335\\_Stability\\_of\\_natural\\_systems\\_Theory\\_and\\_practice](https://www.researchgate.net/publication/276418335_Stability_of_natural_systems_Theory_and_practice)
- 2) Measuring Regulatory Performance EVALUATING THE IMPACT OF REGULATION AND REGULATORY POLICY By Cary Coglianese  
[https://www.oecd.org/gov/regulatorypolicy/1\\_coglianese%20web.pdf](https://www.oecd.org/gov/regulatorypolicy/1_coglianese%20web.pdf)

### *Additional readings:*

1. Александрова Л.В и др. Многокритериальные географо-экологические оценки состояния и устойчивости природных и урбанизированных систем/ Под ред. В.В.Дмитриева и Н.В. Хованова. – СПб.: Изд-во СПбГУ, 2000. – 275 с.
2. Виртуальный тренажерный комплекс по экологической безопасности/ Под ред. В.Д. Толмачева и А.П. Хаустова. – М.: Изд-во МИЭЭ, 2010.
3. Mbanye, W., Wang, F. Environmental regulation and technological innovation: evidence from China. Environ Sci Pollut Res 29, 12890–12910 (2022). <https://doi.org/10.1007/s11356-021-14975-3>
4. Дмитриев В.В., Фрумин Г.Т. Экологическое нормирование и устойчивость природных систем: Учеб. пособие. – СПб.: Наука, 2004. – 294 с.
5. Зейферт Д.В., Бикбулатов И.Х., Маликова Э.М., Кадыров О.Р. Стандарты качества окружающей среды в Российской Федерации: Учеб. пособие. – Уфа: РИО Баш ГУ, 2003. – 274 с.
6. Лукьянчиков Н.Н., Потравный И.М. Экономика и организация природопользования: учебник для вузов. – М.: ЮНИТИ-ДАНА, 2007. – 591 с.
7. Нефть и окружающая среда Калининградской области/ Т. I. Суша/ Под ред. М.Ю. Каджояна и Н.С. Касимова. – М. – Калининград: Янтарный сказ, 2008. – 360 с.
8. Опекунов А.Ю. Экологическое нормирование и оценка воздействия на окружающую среду: Учеб. пособие. – СПб.: Изд-во СПбГУ, 2006. – 261 с.
9. Природопользование, охрана окружающей среды и экономика. Теория и практикум: Учеб. пособие./ Под ред. А.П. Хаустова. – М.: Изд-во РУДН, 2009. – 614 с.

10. Тихомиров Н.П., Потравный И.М., Тихомирова Т.М. Методы анализа и управления эколого экономическими рисками: учеб. пособие для вузов. – М.: ЮНИТИ-ДАНА, 2003. – 350 с.
11. Хаустов, А. П. Нормирование и снижение загрязнения окружающей среды : учебник и практикум для вузов / А. П. Хаустов, М. М. Редина. — 3-е изд., перераб. и доп. — Москва : Издательство Юрайт, 2025. — 454 с.
12. Хаустов, А. П. Экологический мониторинг : учебник для вузов / А. П. Хаустов, М. М. Редина. — 3-е изд., перераб. и доп. — Москва : Издательство Юрайт, 2025. — 549 с.
13. Хаустов А.П., Редина М.М. Ресурсология и менеджмент природных ресурсов: Учеб. пособие. – М.: Изд-во РУДН, 2008. – 434 с.
14. Хаустов А.П. Устойчивость подземной гидросферы и основы экологического нормирования. – М.:ГЕОС, 2007 – 175 с.
15. Хаустов А.П., Редина М.М. Управление природопользованием. – М.: Высшая школа, 2006. – 324 с.
16. Шуйский В.Ф., Максимова Т.В., Петров Д.С. Изобилический метод оценки нормирования многофакторных антропогенных воздействий на пресноводные экосистемы по состоянию макрозообентоса. – СПб.: МАНЭБ, 2004. – 304 с.

*Информационное обеспечение дисциплины (онлайн-курсы):*

Онлайн-курс английского для экологов [www.careerpaths-esp.com](http://www.careerpaths-esp.com)

MOOC Academic writing <https://www.futurelearn.com/courses/emi-academics>

MOOC Academic writing for Intermediate students

<https://www.futurelearn.com/courses/english-for-study-intermediate>

MOOC How to do a literature review <https://www.futurelearn.com/courses/research-writing>

MOOC Developing your research project <https://www.futurelearn.com/courses/researchproject>

MOOC Working with translation, theory and practice

<https://www.futurelearn.com/courses/working-with-translation> MOOC

Writing better emails <https://www.futurelearn.com/courses/betteremails>

MOOC Writing an academic essay: Learning English for academic purposes

<https://www.futurelearn.com/courses/writing-essays-english-academicpurposes>

MOOC Technical report writing for engineers

<https://www.futurelearn.com/courses/technical-report-writing-for-engineers>

MOOC Environmental Standards and Norms for the Sustainability

<https://stepik.org/course/74537/info>

*Internet sources:*

ELS RUDN University and third party EBS, to which university students have access based signed contracts:

- RUDN Electronic Library System, <http://lib.rudn.ru/MegaPro/Web> ;
- ELS University Library Online, <http://www.biblioclub.ru> ;
- EBS Urayt, <http://www.biblio-online.ru> ;
- ELS Student Consultant, <http://www.studentlibrary.ru> ;
- EBS Lan, <http://e.lanbook.com> ;
- EBS Trinity Bridge <http://www.trmost.ru> Databases and search engines:
- Electronic fund of legal and normative-technical documentation, <http://docs.cntd.ru> ;
- Yandex search system <https://www.yandex.ru> ;

- Google search system <https://www.google.com> ;
- Reference database Scopus , <http://www.elsevierscience.ru/products/scopus>  
*Educational and methodological materials for students' self-work studying the discipline / module:*

## **7. ASSESSMENT TOOLKIT AND GRADING SYSTEM FOR MIDTERM ATTESTATION OF STUDENTS IN THE DISCIPLINE (MODULE)**

Assessment toolkit and a grading system to evaluate the level of competences (competences in part) formation as the course results are specified on the TUIS platform.

### **DEVELOPERS:**

Professor of the Department of Environmental

Safety and Product Quality Management

Redina MM.

### **HEAD OF THE DEPARTMENT**

Head of the Department of Environmental

Safety and Product Quality Management

Savenkova E.V.