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 specialty:

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)

2025 г.

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 1 credit units (36 academic hours).

Types of activities		Total ac. hrs.	Semesters	
			2	
Classroom activities (total), including:				
в том числе:				
Lectures (LC)		30	30	
Laboratory activities (LA)				
Practical lessons/Seminars (PC)		30	30	
Independent work		48	48	
Intermediate certification (test with assessment/exam)				
Overall workload	ac. hrs.	**108**	**108**	
	credits	**3**	**3**	

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	L, S

	ecosystem approaches to rationing. Prospects of transformation normation systems. Practical examples.	
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 risk-assessment 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

2) Measuring Regulatory Performance EVALUATING THE IMPACT OF REGULATION AND REGULATORY POLICY By Cary Coglianese https://www.oecd.org/gov/regulatory-policy/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. Mbanyele, 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 природолпьзования: 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. Изоболический 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

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/research-project
MOOC Working with translation, theory and practice
https://www.futurelearn.com/courses/working- with-translation
MOOC Writing better emails https://www.futurelearn.com/courses/better-emails
MOOC Writing an academic essay: Learning English for academic purposes
https://www.futurelearn.com/courses/writing-essays-english-academic-purposes
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 sourses:

ELS RUDN University and third party EBS, to which university students have accessbased 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:

A course of lectures on the discipline «[название дисциплины]».

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 Managemen  Redina MM.

HEAD OF THE DEPARTMENT
Head of the Department
of Environmental Safety and Product Quality Management  Savenkova E.V.