

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

Faculty of ecology
Recommended by MSSN

DISCIPLINE PROGRAM

Title of the discipline «Regulation of natural system quality»

Recommended for the direction of training / specialty

05.06.01 Earth Sciences

Direction of the program (profile)

Ecology: modern environmental studies

Course objectives: 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.

Objectives of the course:

- Familiarize PhD students with the theoretical foundations of systems stability theory;
- Familiarize the PhD students 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 the PhD students with the valuation of risks in the sphere of natural resources, geo-ecology and environmental safety;
- The development of PhD students' practical competence in the analysis and development of environmental standards;
- Familiarize the PhD students with the establishment of corporate systems of environmental regulation.

2. Place the discipline in the structure of the Concentration program: Course has a scientific-theoretical and practical purpose, aimed at those interested in global environmental issues of conformity assessment materials, production processes and products on the international environmental requirements. Designed for people with higher science education (biology, ecology and wildlife management, ecology, nature, geography, commodity research and examination of consumer goods).

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)
General professional competencies			
	GPC-1	Master disciplines	Waste management. Human ecology and hygiene of environment. Product certification according to the international environmental standards
	GPC-2		Teaching practice
Basic competencies			
	PC-1	Master discipline	Waste management. Human ecology and hygiene of environment. Product certification according to the international environmental standards
	PC-3	Foreign language	
	PC-4	Master discipline	
Professional competencies			
	PC -2	Master discipline	Teaching practice
	PC -4		Preparation of the thesis

3. Requirements for the results of the examination of the discipline:

The process of studying the discipline is aimed at the formation of the following competencies:

GPC-1; GPC-2; PC-2; PC-4; BC-1; BC-3; BC-4

1. General professional competencies

Ability to realize the self-directed research activity	GPC-1
Readiness to teaching activity on the field of higher education educational programs	GPC-2

Basic competencies	
Ability to the stocktaking and present-day scientific achievement evaluation, modern ideas generation in solving investigative and practical tasks, including cross-disciplinary fields	BC-1
Readiness to take part in the Russian and international study personnel scientific missions resolution.	BC-3
Readiness to utilize the modern methods and technologies of scientific communication in a state and foreign languages.	BC-4
Ability to plan and solve the tasks of professional and personal enhancement	BC-5
To be able to diagnose issues of environmental protection, to make the impact assessment of building projects and other forms of anthropogenic activities to give recommendations on nature preserving and sustainable development maintenance.	PC -2
To be able to organize and control scientific, research and manufacturing, expert and analytical work and educational work with the use of deepen knowledge in the field of program track	PC -4

As a result of studying the discipline PhD student must:

To know: the current trends in the development of environmental regulation in Russia and in the whole world.

Be able to: use obtained in the course theoretical knowledge in practice.

Owning: information of the major Russian and international regulations governing the issues of environmental legislation

4. The volume of disciplines and types of training work

Total labor discipline is 4 credits.

Type of study	Hours	Semesters			
		1	2		
Class hours (total)	60	1	2		
<i>Including:</i>	-	-	-	-	-
Lectures					
Practical training	80	40	40		
Seminars					
Laboratory works					
Independent work (total)	37	23	14		
Credit system	час	144	72	72	
	зач. ед.	4	2	2	

5. Contents

5.1. Contents sections

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.

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.

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.

5.2. Sections of disciplines and occupations

№ п/п	Sections of disciplines and occupations	lections	PT	LW	Seminars	IW	hours
1.	Theoretical basis of the assessment and modeling of natural systems sustainability		8	0		3	11
2.	The evolution of environmental regulations from the sanitary and hygienic standards for ecosystem evaluation		8	0		3	11
3	The evolution of environmental regulations, from the impact assessment to the ideas of the best technologies		8	0		3	11
4	Foreign system of environmental standards: the EU experience		8	0		3	11
5	Foreign system of environmental standards: the United States and Canada experience		8	0		4	12
6	Foreign system of environmental standards: the Chinese experience		8	0		4	12
7	Rationing of risk tolerance		8	0		4	12
8	Corporate system of ecological regulation and standardization		8	0		4	12
9	The practice of the development of environmental standards in Russia. International projects		8	0		4	12
10	Current priorities of anthropogenic load		8			5	13
			80			37	144

6. Practical trainings (seminars)

№ п/п	Sections of disciplines and occupations	In This section	Hours
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1.	Theoretical basis of the assessment and modeling of natural systems sustainability	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.	8
2.	The evolution of environmental regulations from the sanitary and hygienic standards for ecosystem evaluation	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.	8
3.	The evolution of environmental regulations, from the impact assessment to the ideas of the best technologies	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 on the best technologies.	8
4.	Foreign system of environmental standards: the EU experience	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.	8
5.	Foreign system of environmental standards: the United States and Canada experience	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.	8
6.	Foreign system of environmental standards: the Chinese experience	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.	8
7	Rationing of risk tolerance	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.	8
8	Corporate system of ecological regulation and standardization	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.	8
9	The practice of the development of environmental standards in Russia. International projects	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.	8
10	Current priorities of anthropogenic load	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.	8

8. Material and technical support of the discipline:

Projector

9. Information support of the discipline

database, information and search engines

www.e-library.ru

www.science-direct.com

www.google.ru

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

a) Main literature

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 literature

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. Воробейчик Е.Л., Садыков О.Ф., Фарафонов М.Г. Экологическое нормирование техногенных загрязнений наземных экосистем (локальный уровень). – Екатеринбург: Наука, 1994. – 280 с.
4. Дмитриев В.В., Фрумин Г.Т. Экологическое нормирование и устойчивость природных систем: Учеб. пособие. – СПб.: Наука, 2004. – 294 с.
5. Глазовская М.А. Методологические основы оценки эколого-геохимической устойчивости почв к техногенным воздействиям. – М.: Изд-во МГУ, 1997. – 102 с.
6. 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.
7. Лукьянчиков Н.Н., Потравный И.М. Экономика и организация природопользования: учебник для вузов. – М.: ЮНИТИ-ДАНА, 2007. – 591 с.
8. 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.
9. Опекунов А.Ю. Экологическое нормирование и оценка воздействия на окружающую среду: Учеб. пособие. – СПб.: Изд-во СПбГУ, 2006. – 261 с.
10. Природопользование, охрана окружающей среды и экономика. Теория и практикум: Учеб. пособие./ Под ред. А.П. Хаустова. – М.: Изд-во РУДН, 2009. – 614 с.
11. 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.
12. Хаустов А.П. Основы нормирования техногенных нагрузок на подземную гидросферу: Учеб. пособие. – М.: Изд-во РУДН, 2006. – 99 с.
13. Хаустов А.П., Редина М.М. Нормирование антропогенных воздействий и оценка природоёмкости территорий: Учеб. пособие. – М.: Изд-во РУДН, 2008. – 282 с.
14. Хаустов А.П., Редина М.М. Ресурсология и менеджмент природных ресурсов: Учеб. пособие. – М.: Изд-во РУДН, 2008. – 434 с.
15. Хаустов А.П. Устойчивость подземной гидросферы и основы экологического нормирования. – М.:ГЕОС, 2007 – 175 с.
16. Хаустов А.П., Редина М.М. Управление природопользованием. – М.: Высшая школа, 2006. – 324 с.
17. Шуйский В.Ф., Максимова Т.В., Петров Д.С. Изоболоческий метод оценки нормирования многофакторных антропогенных воздействий на пресноводные экосистемы по состоянию макрообентоса. – СПб.: МАНЭБ, 2004. – 304 с.

Internet sources:

- www.mnr.gov.ru – Website of the Ministry of Natural Resources;
control.mnr.gov.ru – The Federal Service for Supervision of Natural Resources (Rosprirodnadzor);
<http://ecobez.narod.ru/ecosafety.html> – Information materials on the management of environmental safety;
www.dist-cons.ru/modules/Ecology – information materials on environmental support economic activity;
www.ecoindustry.ru – Website of the journal "Ecology of production";

www.hse-rudn.ru – Information materials on the management of labor protection, industrial and environmental safety;
www.unep.org – site programs of the United Nations Environment Programme;
www.wwf.ru – the site of the World Wildlife Fund.

11. Methodical instructions for students on mastering the discipline (module)

The maximum number of credits in the study course - 4. At the same time between the if-honors points and the number of credits is established the following relationship:

The total amount of points	The total amount of points	Credit
91	5	3
91-100	5	3
86 - 91	5 (B)	3
71-85	4 (C)	2
61-70	3+ (D)	1
51 - 60	3 (E)	1
21 - 51	2 (FX)	0
<21	2 (F)	0

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 "Regulation of natural system quality" (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:

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