

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

Institute of Environmental Engineering

(наименование основного учебного подразделения (ОУП)-разработчика ОП ВО)

COURSE SYLLABUS

ENVIRONMENTAL NORMS FOR SUSTAINABILITY

(наименование дисциплины/модуля)

Recommended by the Methodological Council for the Education Field:

05.04.06 Ecology and nature management

(код и наименование направления подготовки/специальности)

The discipline is mastered within the framework of the main professional higher education program:

Economics of natural resources management

(наименование (профиль/специализация) ОП ВО)

1. COURSE GOALS

The course goal is the formation of competencies in accordance with the state educational standard in the direction of 05.04.06, including:

- formation of students' systemic ideas about the theoretical and methodological foundations of environmental regulation;
- formation of ideas about the role of environmental regulation as the main instrument of environmental protection;
- informing students about current trends in the development of the environmental regulatory framework and its implementation, the role of environmental regulation as a basis for effective environmental management and the formation of a sustainable economy;
- informing students about approaches to the harmonization of standards and current trends in the development of domestic environmental standards;
- development of skills in the development of environmental standards and assessments of the sustainability of natural systems, skills in the application of environmental standards in organizational, management and design and production activities.

To achieve this goal in the course of teaching the course, the following tasks are solved:

- formation of ideas about the stability of natural systems;
- creation of a systematic understanding of the structure of environmental regulation in the Russian Federation;
- informing about foreign experience in environmental regulation and harmonization of standards in the field of environmental management;
- analysis of the current system of environmental regulation for various areas of nature management;
- formation of ideas about environmental regulation as a basis for economic regulation of nature management..

2. LEARNING OUTCOMES

The mastering of the discipline "Environmental norms for sustainability" is aimed at the formation of the following competencies (parts of competencies) in students:

Table 2.1. List of competencies formed by students during the development of the discipline (LEARNING OUTCOMES)

Code	Competence	Indicators of competence achievement (within the framework of this discipline)
GC-1	Able to carry out a critical analysis of problem situations based on a systematic approach, to develop a strategy of actions.	GC-1.1 able to analyze a problem situation as a system, identifying its components and the connections between them
		GC-1.2 possesses argumentation and develops a meaningful strategy for solving a problem situation based on systemic and interdisciplinary approaches
		GC -1.3 knows the basics of the strategy and identifies possible risks, suggesting ways to eliminate them
GPC -2	Able to use special and new sections of ecology, geoecology and nature	GPC -2.1 Knows the basics of ecology, geoecology, environmental economics and circular economy, as well as environmental management

Code	Competence	Indicators of competence achievement (within the framework of this discipline)
	management in solving research and applied problems of professional activity.	GPC -2.2 Able to use environmental, economic and other special knowledge and algorithms to solve professional problems
		GPC -2.3 Able to find, analyze and competently use the latest information and modern techniques in the performance of research and applied tasks
GPC -3	Able to apply environmental research methods to solve research and applied problems of professional activity.	GPC -3.1 Knows the principles and methods of environmental monitoring of environmental components
		GPC -3.2 Owns analytical methods for monitoring pollutants and physical impacts and processing the information received
		GPC -3.3 Able to develop systems for environmental monitoring and control in production and solve applied problems in professional activities
SPC-3	Possession of the basics of design, expert-analytical activities and research using modern approaches and methods, equipment and computer systems	SPC-3.1 Able to plan the introduction of modern approaches and methods, equipment and computing systems to solve problems in the professional field
		PC-3.2 Owns the basics of design and expert-analytical activities
SPC-6	Able to develop standard environmental measures and assess the impact of planned facilities or other forms of economic activity on the environment	SPC-6.1 Capable of detecting inconsistencies in the state of environmental components with the requirements of national and international standards
		SPC-6.2 Able to develop programs for monitoring natural complexes under conditions of technogenic loads and programs for environmental rehabilitation of territories

3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The discipline "Environmental norms for sustainability" refers to Compulsory Disciplines of the Higher Education Program.

Within the framework of the higher education program, students also master other disciplines and/or practices that contribute to expected learning outcomes of the discipline "Environmental norms for sustainability".

Table 3.1. List of Higher Education Program components that contribute to expected learning outcomes

Code	Competence	Previous Disciplines (Modules)	Subsequent Disciplines (Modules)
GC-1	Able to carry out a critical analysis of problem situations based on a systematic approach,		

Code	Competence	Previous Disciplines (Modules)	Subsequent Disciplines (Modules)
	to develop a strategy of actions.		
GPC -2	Able to use special and new sections of ecology, geoecology and nature management in solving research and applied problems of professional activity.	Estimations of natural resources / Оценки природных ресурсов Methodology of scientific creation / Методология научного творчества	Environmental standards and nature management / Экологические стандарты и природопользование Modern remediation technologies / Современные технологии ремедиации Economic aspects of natural resources management / Экономические аспекты природопользования Management of water resources / Управление водными ресурсами Environmental-economic aspects of environmental projects / Эколого-экономические аспекты экологических проектов History and methology of ecology and natural resources management / История и методология экологии и природопользования Iternational collaboration / Международное сотрудничество Engineering ecology / Инженерная экология Monitoring of environmental impacts / Мониторинг экологических воздействий Industrial safety / Промышленная безопасность Simulation and prevention of accidents / Моделирование и предупреждение аварий Учебная практика / Educational practice Производственная практика / Production practice Научно-исследовательская работа / Research work НИР / Research work Преддипломная практика / Pre-graduate practice
GPC -3	Able to apply environmental research methods to solve research and applied problems of professional activity.	Estimations of natural resources / Оценки природных ресурсов	Modern remediation technologies / Современные технологии ремедиации Economic aspects of natural resources management / Экономические аспекты природопользования Management of energy resources / Менеджмент ресурсов энергетики

Code	Competence	Previous Disciplines (Modules)	Subsequent Disciplines (Modules)
			Management of water resources / Управление водными ресурсами Environmental-economic aspects of environmental projects / Эколого-экономические аспекты экологических проектов Standards of environmental management and occupational safety / Стандарты экологического менеджмента и охраны труда Occupational safety and HSE-audit / Охрана труда и HSE-аудит Wastes: Landfills, Processing and Recycling / Отходы: хранение, захоронение, рециклинг Surface water quality: modeling and management / Качество поверхностных вод: моделирование и менеджмент Учебная практика / Educational practice Производственная практика / Production practice Научно-исследовательская работа / Research work НИР / Research work Преддипломная практика / Pre-graduate practice
SPC -2	Ability to creatively use knowledge of fundamental and applied sections of special disciplines in production and technological activities	Methodology of scientific creation / Методология научного творчества Научно-исследовательская работа / Research work	Engineering ecology / Инженерная экология Monitoring of environmental impacts / Мониторинг экологических воздействий Базовая компонента Учебная практика / Educational practice Производственная практика / Production practice НИР / Research work Преддипломная практика / Pre-graduate practice Защита ВКР / Protection of the final qualifying work
SPC-3	Possession of the basics of design, expert-analytical activities and research using modern approaches and methods,	Estimations of natural resources / Оценки природных ресурсов Modern technologies for nature protection /	Economic aspects of natural resources management / Экономические аспекты природопользования Management of energy resources / Менеджмент ресурсов энергетики Engineering ecology / Инженерная экология

Code	Competence	Previous Disciplines (Modules)	Subsequent Disciplines (Modules)
	equipment and computer systems	Современные технологии защиты окружающей среды	Monitoring of environmental impacts / Мониторинг экологических воздействий Учебная практика / Educational practice Производственная практика / Production practice Научно-исследовательская работа / Research work НИР / Research work Преддипломная практика / Pre-graduate practice
SPC-6	Able to diagnose problems of nature conservation, develop practical recommendations for its protection and sustainable development	Management of natural resources / Менеджмент природных ресурсов	Industrial nature management and economics / Промышленное природопользование и экономика Environmental standards and nature management / Экологические стандарты и природопользование Modern remediation technologies / Современные технологии ремедиации Economic aspects of natural resources management / Экономические аспекты природопользования Management of energy resources / Менеджмент ресурсов энергетики Standards of environmental management and occupational safety / Стандарты экологического менеджмента и охраны труда Occupational safety and HSE-audit / Охрана труда и HSE-аудит Environmental statistics / Экологическая статистика Environmental accounting and reporting / Экологический учет и отчетность Wastes: Landfills, Processing and Recycling / Отходы: хранение, захоронение, рециклинг Surface water quality: modeling and management / Качество поверхностных вод: моделирование и менеджмент Industrial safety / Промышленная безопасность Simulation and prevention of accidents / Моделирование и предупреждение аварий Учебная практика / Educational practice Производственная практика / Production practice

Code	Competence	Previous Disciplines (Modules)	Subsequent Disciplines (Modules)
			Научно-исследовательская работа / Research work НИР / Research work Преддипломная практика / Pre-graduate practice

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

Workload of the course «Environmental norms for sustainability» is 3 ECTS.

Table 4.1. Types of academic activities during the period of the HE program mastering

Вид учебной работы	TOTAL	Semesters			
		1	2	3	4
<i>Contact academic hours</i>	34			34	
Incl.:					
Lectures					
Lab work					
Seminars	17			17	
<i>Self-study</i>	41			41	
<i>Evaluation and assessment</i>	14			14	
Total workload	Ac.hours	72		72	
	ECTS	2		2	

5. COURSE CONTENTS

Table 5.1. The content of the discipline (module) by type of academic work

Name of the discipline section	Content of the section (topics)	Type of academic activity*
Introduction	Modern problems of nature management. Environmental norms and standards as a base for the efficient nature management	Seminars
Environmental norms and regulations for the atmosphere protection	Factors of the pollution and self-purification of the atmosphere. Main models of the atmosphere pollution. Norms of the atmospheric quality: approaches to the setting of norms and examples. Regulation of the atmospheric pollution	Seminars
Environmental norms and regulations for the protection of water quality	Factors of the pollution and self-purification of the water bodies. Basic models of the pollution of water flows: the Russian experience. Norms of water quality	Seminars
Environmental norms and regulations for the protection of soil	Soil quality standards: approaches to justification of norms, types of norms, examples	Seminars
Environmental norms and regulations in the waste management	Pyramid of the waste management. Waste as the “secondary resources”: recycling and “waste to energy” technologies. Norms for the assessment	Seminars

	of the waste danger. Norms of the waste formation, accumulation, storage and processing	
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6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

Table 6.1. Classroom equipment and technology support requirements

Classroom for Academic Activity Type	CLASSROOM EQUIPMENT	Specialized learning, laboratory equipment, software and materials for the mastering the course
Seminars	Classroom, equipped with a set of specialized furniture; whiteboard; a set of devices includes portable multimedia projector, laptop, projection screen, Stable wireless Internet connection. Software: Microsoft Windows, MS Office / Office 365, MS Teams, Chrome (latest stable release), Skype	-
Self-studies	An auditorium for independent work of students (can be used for seminars and consultations), equipped with a set of specialized furniture and computers with access to an electronic information and educational environment.	-

7. RECOMMENDED SOURCES FOR COURSE STUDIES

Main reading:

1. Khaustov A. P., Redina M. M. Environmental standards and norms. – 2020. URL: <https://izd-mn.com/PDF/47MNNPU20.pdf>

Additional sources:

1. DEVELOPMENT AND INTERNATIONAL ECONOMIC CO-OPERATION: ENVIRONMENT. Report of the World Commission on Environment and Development. URL: <http://upload.wikimedia.org/wikisource/en/d/d7/Our-common-future.pdf>

2. REPORT OF THE UNITED NATIONS CONFERENCE ON ENVIRONMENT AND DEVELOPMENT (Rio de Janeiro, 3-14 June 1992). URL: <https://www.un.org/documents/ga/conf151/aconf15126-3annex3.htm>

3. Shaker, R.R. (2015). The spatial distribution of development in Europe and its underlying sustainability correlations. Applied Geography, 63, 304-314.

4. SUSTAINABLE DEVELOPMENT KNOWLEDGE PLATFORM. URL: <https://sustainabledevelopment.un.org>

Internet-sources:

1. Electronic library system of the RUDN and third-party electronic library systems, to which university students have access on the basis of concluded contracts:

- electronic library system of the RUDN University <http://lib.rudn.ru/MegaPro/Web>

- electronic library system «Университетская библиотека онлайн» <http://www.biblioclub.ru>

- electronic library system Юрайт <http://www.biblio-online.ru>
- electronic library system «Консультант студента» www.studentlibrary.ru
- electronic library system «Лань» <http://e.lanbook.com/>
- electronic library system «Троицкий мост»

2. Databases and search engines:

- electronic fund of legal and regulatory and technical documentation <http://docs.cntd.ru/>
- Yandex search engine <https://www.yandex.ru/>
- Google search engine <https://www.google.ru/>
- abstract database SCOPUS <http://www.elsevierscience.ru/products/scopus/>
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*Educational and methodological materials for independent work of students during the development of the discipline/ module *:*

1. A course of lectures on the discipline "Environmental norms for sustainability".

* - all educational and methodological materials for independent work of students are placed in accordance with the current procedure on the discipline page in the Telecommunication educational and Information System!

8. MID-TERM ASSESSMENT AND EVALUATION TOOLKIT

Evaluation materials and a point-rating system* for assessing the level of competence formation (part of competencies) based on the results of mastering the discipline "Environmental norms for sustainability" are presented in the Appendix to this Work Program of the discipline.

* - evaluation toolkit and ranking system are formed on the basis of the requirements of the relevant local regulatory act of the RUDN (regulations / order).

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