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**PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA
NAMED AFTER PATRICE LUMUMBA
Institute of Environmental Engineering**

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

COURSE SYLLABUS

Economic aspects of natural resources management

(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 purpose of the discipline is to familiarize students with the main criteria, indicators and methods of economic assessment of natural resources.

Tasks:

- familiarization with the criteria and indicators for the economic assessment of resources;
- familiarization with the role of economic assessment of natural resources in environmental management;
- familiarization with the techniques and methods of economic assessment of natural resources..

2. LEARNING OUTCOMES

The mastering of the discipline "Economic aspects of natural resources management" 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)
GPC-2	Able to use special and new sections of ecology, geoecology and nature management in solving research and applied problems of professional activity.	GPC -2.1 Knows the basics of ecology, geoecology, environmental economics and circular economy, as well as environmental management
		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-5	Able to develop standard environmental measures and assess the impact of planned facilities or other	SPC-5.1 Able to develop and plan the implementation of standard environmental measures, taking into account international practice and the requirements of national legislation

Code	Competence	Indicators of competence achievement (within the framework of this discipline)
	forms of economic activity on the environment	SPC-5.2. Has the skills to assess the impact of planned structures or other forms of economic activity on the environment SPC-5.3 Knows the requirements for the preparation and implementation of programs for the environmental modernization of enterprises, the introduction of BAT, the organization of environmental monitoring, accounting and reporting
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 "Economic aspects of natural resources management" 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 "Economic aspects of natural resources management".

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

Code	Competence	Previous Disciplines (Modules)	Subsequent Disciplines (Modules)
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 History and methodology of ecology and natural resources management / История и методология экологии и природопользования International collaboration / Международное сотрудничество Научно-исследовательская работа / Research work Methodology of scientific creation / Методология научного творчества Modern technologies for nature protection / Современные технологии защиты окружающей среды Environmental standards and nature management / Экологические стандарты и природопользование

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 Environmental norms for sustainability / Экологические нормы для устойчивого развития 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 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 Научно-исследовательская работа / Research work Modern technologies for nature protection / Современные технологии защиты окружающей среды Management of energy resources / Менеджмент ресурсов энергетики Management of water resources / Управление водными ресурсами Environmental-economic aspects of environmental projects / Эколого-экономические аспекты экологических проектов Environmental norms for sustainability / Экологические нормы для устойчивого развития 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

Code	Competence	Previous Disciplines (Modules)	Subsequent Disciplines (Modules)
			Surface water quality: modeling and management / Качество поверхностных вод: моделирование и менеджмент Учебная практика / Educational practice Производственная практика / Production practice НИР / Research work Преддипломная практика / Pre-graduate practice
SPC -3	Possession of the basics of design, expert-analytical activities and research using modern approaches and methods, equipment and computer systems		Estimations of natural resources / Оценки природных ресурсов Научно-исследовательская работа / Research work Modern technologies for nature protection / Современные технологии защиты окружающей среды Management of energy resources / Менеджмент ресурсов энергетики Environmental norms for sustainability / Экологические нормы для устойчивого развития Engineering ecology / Инженерная экология Monitoring of environmental impacts / Мониторинг экологических воздействий Учебная практика / Educational practice Производственная практика / Production practice НИР / Research work Преддипломная практика / Pre-graduate practice
SPC-5	Able to develop standard environmental measures and assess the impact of planned facilities or other forms of economic activity on the environment		Estimations of natural resources / Оценки природных ресурсов Management of environmental-economic risks / Управление эколого-экономическими рисками Учебная практика / Educational practice Научно-исследовательская работа / Research work Management of water resources / Управление водными ресурсами Environmental-economic aspects of environmental projects / Эколого-экономические аспекты экологических проектов Environmental statistics / Экологическая статистика

Code	Competence	Previous Disciplines (Modules)	Subsequent Disciplines (Modules)
			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 Производственная практика / Production practice НИР / Research work Преддипломная практика / Pre-graduate practice
SPC-6	Able to develop standard environmental measures and assess the impact of planned facilities or other forms of economic activity on the environment		Management of natural resources / Менеджмент природных ресурсов Modern technologies for nature protection / Современные технологии защиты окружающей среды Industrial nature management and economics / Промышленное природопользование и экономика Economic aspects of natural resources management / Экономические аспекты природопользования Standards of environmental management and occupational safety / Стандарты экологического менеджмента и охраны труда Occupational safety and HSE-audit / Охрана труда и HSE-аудит Management of energy resources / Менеджмент ресурсов энергетики Environmental norms for sustainability / Экологические нормы для устойчивого развития 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

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

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

Workload of the course «Economic aspects of natural resources management» is 2 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				
Incl.:						
Lectures		17	17			
Lab work						
Seminars		17	17			
<i>Self-study</i>		22	58			
<i>Evaluation and assessment</i>		16	16			
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*
Remediation technologies: main tasks and characteristics; classification	Remediation technologies: main tasks and characteristics; classification: physical methods; chemical methods; biological methods; in situ and ex situ technologies	Lectures, Seminars
Soil remediation technologies	Soil remediation technologies: practical examples, efficiency, standards. Efficiency and risks	Lectures, Seminars
Remediation of wastewater	Remediation of wastewater: practical examples, efficiency, standards. Efficiency and risks	Lectures, Seminars
Remediation of waste landfills	Remediation of waste landfills: practical examples, efficiency, standards. Efficiency and risks	Lectures, Seminars

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
Lecture	An auditorium for conducting lecture-type classes, equipped with a set of specialized furniture; a board (screen) and technical means of multimedia presentations.	-
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:*

Assistant T., SCHEDULE C. Environmental Economics and Resource Policy //Instructor. – 2018.

Pindyck R. S. Uncertainty in environmental economics //Review of environmental economics and policy. – 2020.

Lewis L., Tietenberg T. H. Environmental economics and policy. – Routledge, 2019.

Additional sources:

1. Environmental economics. Vol. 1. Essentials. – URL: https://abi.gtk.szie.hu/system/files/upload/course_material/enviroecon-vol1.pdf.

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 "Economic aspects of natural resources management".

* - 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 "Economic aspects of natural resources management" 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).

DEVELOPER:

Professor of the Department of
Environmental Safety and
Product Quality Management

Position, Department



Signature

Redina M.M.

Name

HEAD OF THE DEPARTMENT:

Head of the Department of
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