PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA NAMED AFTER PATRICE LUMUMBA

Institute of Environmental Engineering

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

COURSE SYLLABUS

INDUSTRIAL NATURE MANAGEMENT AND ECONOMICS

(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)

2026

1. COURSE GOALS

The purpose of the discipline is obtaining theoretical knowledge and practical competencies in the field of assessing the environmental problems of industrial nature management, choosing ways to organize environmental protection and justifying their ecological and economic efficiency.

Tasks:

- familiarization with the main sectoral problems of industrial environmental management of the main sectors of the economy;
- obtaining skills in ecological and economic assessment of environmental damage as a result of problems in the field of industrial nature management;
- obtaining skills to substantiate the ecological and economic efficiency of the choice of environmental protection measures and the best available technologies.

2. LEARNING OUTCOMES

The mastering of the discipline "Industrial nature management and economics" 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 -2	able to manage the project at all stages of its life cycle.	**GC -2.1** able to formulate a project task based on the problem posed and the way to solve it
		GC-2.2 able to develop a project concept, formulates a goal, tasks, justifies the relevance, expected results and scope of their application
		GC-2.3 knows how to develop a project implementation plan taking into account possible risks, plans the necessary resources
SPC -4	Able to use modern methods of processing and interpreting environmental information in scientific and industrial research.	**SPC-4.1** Able to apply modern methods of processing and interpreting environmental information when conducting industrial research
		SPC-4.2 Able to interpret the results of studies in terms of compliance with safety and performance indicators
		SPC-4.3 Has the skills to conduct control and supervisory activities based on modern methods of processing environmental information
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 "Industrial nature management and economics" 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 "Industrial nature management and economics".

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, to develop a strategy of actions.		IT in ecology and natural resources management / Компьютерные технологии в управлении природопользованием Environmental noms for sustainability / Экологические нормы для устойчивого развития Environmental statistics / Экологическая статистика Учебная практика / Educational practice Производственная практика / Production practice Научно-исследовательская работа / Research work НИР / Research work Преддипломная практика / Pre-graduate practice
GC -2	Able to manage the project at all stages of its life cycle		Management of environmental risks / Управление экологическими рисками Industrial nature management and economics / Промышленное природопользование и экономика Modern remediation technologies / Современные технологии ремедиации Management of energy resources / Менеджмент ресурсов энергетики Базовая компонента Учебная практика / Educational practice Производственная практика / Production practice Научно-исследовательская работа / Research work

Code	Competence	Previous Disciplines (Modules)	Subsequent Disciplines (Modules)
			НИР / Research work Преддипломная практика / Pre-graduate practice
GPC -4	Able to apply regulatory legal acts and norms of professional ethics in the field of ecology and nature management.		Estimations of natural resources / Оценки природных ресурсов Management of environmental-economic risks / Управление эколого-экономическими рисками Учебная практика / Educational practice Производственная практика / Production practice Научно-исследовательская работа / Research work 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 Environmental standards and nature management / Экологические стандарты и природопользование Modern remediation technologies / Современные технологии ремедиации Management of water resources / Управление водными ресурсами Environmental-economic aspects of environmental projects / Эколого-экономические аспекты экологических проектов 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 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 «Industrial nature management and economics» 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
Contact academic hours		*34*				
Incl.:						
Lectures		17	17			
Lab work						
Seminars		17	17			
Self-study		*22*	*22*			
Evaluation and assessment		*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*
Introduction	Ecology as a complex science direction. Stages of the development of the ecological knowledge and science. System of the ecological disciplines. Ecology and nature management. Ecology and sustainability	Lectures, Seminars
Concept of the nature (use) management	Main directions and types of nature management. Laws and rules in ecology. Modern ecological problems of nature management: environmental consequences of gaps in nature management.	Lectures, Seminars
Human ecology	Stages of human development as a biological species. Dependence on natural conditions and factors. Periods of the noosphere development	Lectures, Seminars
Crises in the history of mankind	Crises in the historical development: sources and consequences. Modern stage of the development: difficulties in the functioning of ecosystems. Demographic crisis. Social crisis. Energy crisis	Lectures, Seminars

Strategies for overcoming the environmental crisis	Sustainable development strategies and goals. Solving environmental and social problems. Solving the problems of resource availability. Modern ecological research.	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:*

1. Ahmad T. A. Environmental Issues in the History Textbook. – 2019.
2. Antweiler W. Elements of environmental management //Elements of Environmental Management. – University of Toronto press, 2018.

Additional sources:

Das T. K. Industrial environmental management: Engineering, science, and policy. – John Wiley & Sons, 2020.

Johnstone L., Hallberg P. ISO 14001 adoption and environmental performance in small to medium sized enterprises //Journal of environmental management. – 2020. – Т. 266. – С. 110592.

Stefana E. et al. A review of energy and environmental management practices in cast iron foundries to increase sustainability //Sustainability. – 2019. – Т. 11. – №. 24. – С. 7245.

Griffith A. Integrated management systems for construction: Quality, environment and safety. – Routledge, 2018.

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/
- ……..

*Educational and methodological materials for independent work of students during the development of the discipline/ module *:*

1. A course of lectures on the discipline "Industrial nature management and economics".

* - 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 "Industrial nature management and economics" 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		**Redina M.M.**
Position, Department	Signature	Name

HEAD OF THE DEPARTMENT:

Head of the Department of Environmental Safety and Product Quality Management		**Savenkova E.V.**
Department	Signature	Name

HAED OF THE HIGHER EDUCATION PROGRAM:

Professor of the Department of Environmental Safety and Product Quality Management		**Redina M.M.**
Position, Department	Signature	Name