PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA NAMED AFTER PATRICE LUMUMBA

Institute of Environmental Engineering

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

COURSE SYLLABUS

ESTIMATIONS OF NATURAL RESOURCES

(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)

2024

1. COURSE GOALS

The course goal is to familiarize students with the main criteria, indicators and methods of qualitative and quantitative assessment of natural resources.

Tasks:

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

2. LEARNING OUTCOMES

The mastering of the discipline "Estimations of natural resources" 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
GPC -4	Able to apply regulatory legal acts and norms of professional ethics in the field of ecology and nature management.	**GPC -4.1** Knows the basics of environmental regulation and the basics of legislation in the field of nature management
		GPC -4.2 Knows how to use and apply regulatory legal acts in the field of ecology and nature management
		GPC -4.3 Able to use the norms of professional ethics in their professional activities
SPC-3	Possession of the basics of design, expert-analytical activities and research	SPC-3.1 Able to plan the introduction of modern approaches and methods, equipment and computing systems to solve problems in the professional field

Code	Competence	Indicators of competence achievement (within the framework of this discipline)
	using modern approaches and methods, equipment and computer systems	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 forms of economic activity on the environment	**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
		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

3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The discipline "Estimations of natural resources" 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 "Estimations of natural resources".

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.		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 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-

Code	Competence	Previous Disciplines (Modules)	Subsequent Disciplines (Modules)
			экономические аспекты экологических проектов Environmental noms for sustainability / Экологические нормы для устойчивого развития 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.		Modern technologies for nature protection / Современные технологии защиты окружающей среды Modern remediation technologies / Современные технологии ремедиации Economic aspects of natural resources management / Экономические аспекты природопользования 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

Code	Competence	Previous Disciplines (Modules)	Subsequent Disciplines (Modules)
			Environmental noms for sustainability / Экологические нормы для устойчивого развития Standards of environmental management and occupational safety / Стандарты экологического менеджмента и охраны труда Occopational 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
GPC -4	Able to apply regulatory legal acts and norms of professional ethics in the field of ecology and nature management.		Management of environmental-economic risks / Управление эколого-экономическими рисками Management of natural resources / Менеджмент природных ресурсов Учебная практика / Educational practice Производственная практика / Production practice Научно-исследовательская работа / Research work 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		Modern technologies for nature protection / Современные технологии защиты окружающей среды Modern remediation technologies / Современные технологии ремедиации Economic aspects of natural resources management / Экономические аспекты природопользования

Code	Competence	Previous Disciplines (Modules)	Subsequent Disciplines (Modules)
			Management of energy resources / Менеджмент ресурсов энергетики Environmental noms 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 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		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 «Estimations of natural resources» 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**
Contact academic hours		*34*			*34*	
Incl.:						
Lectures		17	17			
Lab work						
Seminars		17	17			
Self-study		*22*	*58*			
Evaluation and assessment		*16*	*16*			
Total workload	Ac.hours	**108**	**108**			
	ECTS	**3**	**3**			

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. Huynh T. L. D., Burggraf T., Nasir M. A. Financialisation of natural resources & instability caused by risk transfer in commodity markets //Resources Policy. – 2020. – T. 66. – C. 101620.
2. Monge-Naranjo A., Sánchez J. M., Santaeulalia-Llopis R. Natural resources and global misallocation //American Economic Journal: Macroeconomics. – 2019. – T. 11. – №. 2. – C. 79-126.
3. Ignatyeva M., Yurak V., Logvinenko O. A new look at the natural capital concept: Approaches, structure, and evaluation procedure //Sustainability. – 2020. – T. 12. – №. 21. – C. 9236.

Additional sources:

Ackermann T., Andersson G., Soder L. (2001): Distributed Generation: A Definition. In: *Electric Power System Research,* Vol. 57 (2001), pp. 195-204.

Anderson W., White V., Finney A. (2010): 'You just have to get by': Coping with low incomes and cold homes. University of Bristol. https://core.ac.uk/download/pdf/29025974.pdf.
Bashmakov (2009): Resource of energy efficiency in Russia: scale, costs, and benefits. Energy Efficiency 2, 369–386. www.mdpi.com/journal/sustainability. In: section 7.6.2 Climate Change 2014: Mitigation of Climate Change. Intergovernmental Panel on Climate Change. http://www.ipcc.ch/report/ar5/wg3/
BlackRock (2017): *BlackRock. Black Rock Investment Stewardship engages on Climate Risk*. https://www.blackrock.com/corporate/en-us/literature/market-commentary/how-blackrock-investment-stewardship-engages-on-climate-risk-march2017.pdf
Blok, K., Hofheinz, P., Kerkhoven, J. (2015): *The 2050 Energy Productivity and Economic Prosperity Index. How Efficiency Will Drive Growth, Create Jobs and Spread Wellbeing Throughout Society.* https://www.ecofys.com/files/files/the-2015-energy-productivity-andeconomic-prosperity-index.pdf
Bloomberg New Energy Finance (2017): *New Energy Outlook 2017.* https://about.bnef.com/new-energy-outlook/
Bondarak J. (2016): *Poland Coal Sector Update*. Presented at the Global Methane Initiative Coal Subcommittee Meeting 24 October 2016. https://www.unece.org/fileadmin/DAM/energy/se/pp/coal/cmm/11cmm_gmi.cs_oct2016/4_GMI_Poland_coal.pdf
BPIE and i24c - Buildings Performance Institute Europe; Industrial Innovation for Competitiveness (2016): *Scaling up Deep Energy Renovation, Unleashing the Potential through Innovation and industrialization. Building Performance Institute of Europe and Industrial Innovation for Competitiveness.* http://bpie.eu/publication/scaling-up-deep-energy-renovation/
Brunner K., Spitzerb M., Christanell A. (2012): *Experiencing fuel poverty. Coping strategies of low-income households in Vienna/Austria*. http://www.sciencedirect.com/science/article/pii/S0301421511009748

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 "Estimations of natural resources ".

* - 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 "Estimations of natural resources " 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.**
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