

Federal State Autonomous Educational Institution of Higher Education

"Peoples' Friendship University of Russia"

Faculty of Ecology

Recommended by the Methodological council
on specialties and study directions

WORKING PROGRAM OF THE DISCIPLINE

Name of the discipline

MANAGEMENT OF ENVIRONMENTAL-ECONOMIC RISKS

Recommended for the specialty/ direction

05.04.06 Ecology and nature management

Masters' program:

Economics of natural resources management

1. Goals and objectives of the discipline:

The purpose of the discipline is to familiarize students with the theoretical foundations of identification and management of prevention and elimination of the consequences of natural and industrial emergency situations and accidents.

The main tasks of the discipline are:

- familiarizing students with the basic approaches of the identification of the risk sources and consequences of natural and industrial emergency situations and accidents;
- familiarization of students with the main approaches to the elimination of the consequences of natural and industrial emergency situations and accidents.

2. Place of discipline in the structure of the educational program:

The discipline Environmental Management Standards refers to an optional part of block 2 of the curriculum.

Table No. 1 shows the previous and subsequent disciplines aimed at the formation of the discipline's competencies in accordance with the competence matrix of EP HE.

Table 1

Previous and subsequent disciplines aimed at building competencies

Nr.	Code and name of competence	Preceding disciplines	Subsequent disciplines (groups of disciplines)
General professional competencies			-
1	GPC-3, 4, 6, 8		Natural resource management Economic valuation of natural resources Ecologic-economical aspects of environmental projects
Professional competencies (type of professional activity - research, control and expert, organizational and management)			
3	PC-3, 5	-	Research work

3. Requirements for the results of mastering the discipline:

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

- the ability to carry out the organization and management of research and development and expert and analytical work using advanced knowledge in the field of environmental management; develop measures in the organization for economic regulation and personnel management in the field of environmental protection; planning, development, implementation and maintenance of functioning monitoring of the functioning and improvement of the OSMS; to apply in practice regulations in the field of environmental protection; work with federal information resources and information systems in the field of environmental protection, with statistical and reporting data (PC9).

(indicated in accordance with OS VO RUDN / FGOS VO)

As a result of studying the discipline, the student must:

Know: the legal basis for standardization, the structure and purpose of environmental management standards.

Be able to: develop basic documents for environmental management systems.

Possess: modern mathematical apparatus, computing facilities and basic mathematical knowledge.

4. The scope of the discipline and types of educational work

The total labor intensity of the discipline	2 credits								
Type of educational work	Total hours	Semesters							
		1	2	3	4	5	6	7	8
Classroom Lessons (total)									
Including:									
<i>Lectures</i>									
<i>Practical lessons</i>	18					18			
<i>Seminars</i>	-								
<i>Laboratory work</i>	-								
<i>Independent work</i>	124								
Control	2								
The total labor intensity, hours.	144								
The total labor intensity, credits	4								

5. Discipline content

5.1 Contents of discipline sections

Discipline section name	Section content (topics)
Introduction	The concept of environmental risks. Enterprise risks and their assessment. Project risks, their minimization and the need to take into account in the analysis of the sustainability of investment projects
Analysis and assessment of risk	Environmental and economic risks and methods of their analysis and assessment. Risk identification. Risk factors. Economic characteristics of environmental risks
Environmental risk and environmental projects	Environmental and industrial safety risks in investment projects. Climatic risks.
Management of risks in nature management	Management of risks. Environmental insurance. Minimization of environmental risks for the sustainable operation of enterprises
Minimization of environmental risks	Minimization of environmental risks and implementation of environmental management systems

5.2* Sections of disciplines and types of classes

№ п/п	Discipline section name	Lectures	Practical lessons	Independent work	Total hours
1.	Introduction		2	24	26
2.	Analysis and assessment of risk		4	24	28
3.	Environmental risk and environmental projects		4	24	28
4.	Management of risks in nature management		4	24	28

5.	Minimization of environmental risks		4	24	28
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6. Laboratory workshop (if available) - NO

7. Practical lessons; seminars

Nr	Discipline section	Subjects of practical classes (seminars)	Total hours
1.	Introduction	Identification of risk sources	1
2.	Analysis and assessment of risk	Practical approaches of risk assessment	2
3	Environmental risk and environmental projects	Project risks and project management	2
4	Management of risks in nature management	Justification of the optimal risk management approaches	2
5	Minimization of environmental risks	Practical risk management measures	1

8. Material and technical base of the discipline:

An auditorium equipped with multimedia equipment and a personal computer with a standard package of office programs.

9. Information support of the discipline

When studying the discipline, traditional information technologies are used to present the theoretical part of the material by the teacher (PowerPoint presentation).

a) Software

MSWindows; MSOffice

b) databases, reference and search systems

www.mnr.gov.ru - site of the Ministry of Natural Resources of the Russian Federation;

<http://rpn.gov.ru/> - Federal Service for Supervision in the Sphere of Natural Resources

(Rosprirodnadzor);

www.ecoindustry.ru - site of the journal "Production Ecology";

www.unep.org - site of the United Nations Environment Program;

www.wwf.ru - site of the World Wildlife Fund.

<http://burondt.ru/> - website of the BAT Bureau - information on the introduction of standardization based on the best available technologies

http://www.mnr.gov.ru/activity/directions/zelenye_standarty/zelenye_standarty/?sphrase_id=124597 - information on the development, application and implementation of "green standards"

http://www.mnr.gov.ru/activity/directions/natsionalnyy_proekt_ekologiya/ - information on the progress of the National Project "Ecology"

10. Literature

Basic list

1. Khaustov A.P., Redina M.M. Rationing and reduction of environmental pollution. M.: Yurayt, 2017. -- 364 p. - Presented at the RUDN UNIBC and available on the website of the Yurayt publishing house at: https://biblio-online.ru/viewer/normirovanie-i-snizhenie-zagryazneniya-okruzhayuschey-sredy-432790?share_image_id=#page/1
2. Leikin Yu.A. "Fundamentals of environmental regulation: Textbook. M.: Publishing house "Forum", 2018

Additional list

- 1) Abrahamsen, E. B., Abrahamsen, H. B., Milazzo, M. F., & Selvik, J. T. (2018). Using the ALARP principle for safety management in the energy production sector of chemical industry. *Reliability Engineering & System Safety*, 169, 160-165.
- 2) Andrews, C. J., & Govil, S. (1995). Becoming proactive about environmental risks: regulatory reform and risk management in the US electricity sector. *Energy Policy*, 23(10), 885-892.
- 3) Barton, B., Redgwell, C., Rønne, A., & Zillman, D. N. (Eds.). (2004). *Energy security: managing risk in a dynamic legal and regulatory environment*. Oxford University Press on Demand.
- 4) Cerin, P. (2002). Communication in corporate environmental reports. *Corporate Social Responsibility and Environmental Management*, 9(1), 46-65.
- 5) Criscuolo, C., & Menon, C. (2015). Environmental policies and risk finance in the green sector: Cross-country evidence. *Energy Policy*, 83, 38-56.
- 6) Davies, G., Prpich, G., Strachan, N., & Pollard, S. (2014). *UKERC Energy Strategy Under Uncertainties: Identifying Techniques for Managing Uncertainty in the Energy Sector*. UKERC Working Paper UKERC/WP/FG/2014/0012014.
- 7) Davison, M., Gurtuna, O., Masse, C., & Mills, B. (2012). Factors affecting the value of environmental predictions to the energy sector. *Environmental Systems Research*, 1(1), 4.
- 8) Fidler, C., & Noble, B. (2012). Advancing strategic environmental assessment in the offshore oil and gas sector: Lessons from Norway, Canada, and the United Kingdom. *Environmental Impact Assessment Review*, 34, 12-21.
- 9) Finnveden, G., Nilsson, M., Johansson, J., Persson, Å., Moberg, Å., & Carlsson, T. (2003). Strategic environmental assessment methodologies—applications within the energy sector. *Environmental impact assessment review*, 23(1), 91-123.
- 10) Fortuński, B. (2008). Does the environmental management standard ISO 14001 stimulate sustainable development? An example from the energy sector in Poland. *Management of Environmental Quality: An International Journal*, 19(2), 204-212.
- 11) Greening, L. A., & Bernow, S. (2004). Design of coordinated energy and environmental policies: use of multi-criteria decision-making. *Energy policy*, 32(6), 721-735.
- 12) de Haes, H. A. U., & Heijungs, R. (2007). Life-cycle assessment for energy analysis and management. *Applied Energy*, 84(7-8), 817-827.
- 13) Ko, S., & Lee, K. W. (Eds.). (2012). *Risks and Opportunities of the Energy Sector in East Siberia and the Russian Far East: For Better Risk Management and Sustainable Energy Development* (Vol. 16). LIT Verlag Münster.
- 14) Lee, C. T., Rozali, N. E. M., Van Fan, Y., Klemeš, J. J., & Towprayoon, S. (2018). Low-carbon emission development in Asia: energy sector, waste management and

environmental management system. *Clean Technologies and Environmental Policy*, 20(3), 443-449.

- 15) Omer, A. M. (2008). Energy, environment and sustainable development. *Renewable and sustainable energy reviews*, 12(9), 2265-2300.
- 16) Salzmann, O. (2008). *Corporate Sustainability Management in the Energy Sector*. Gabler.
- 17) Shiers, D. E. (2000). "Green" developments: environmentally responsible buildings in the UK commercial property sector. *Property Management*, 18(5), 352-365.
- 18) Sidortsov, R. (2014). Reinventing rules for environmental risk governance in the energy sector. *Energy Research & Social Science*, 1, 171-182.
- 19) Stjepcevic, J., & Siksnelyte, I. (2017). Corporate social responsibility in energy sector. *Transformations in Business & Economics*, 16(1), 40.
- 20) Xavier, R., Komendantova, N., Jarbandhan, V., & Nel, D. (2017). Participatory governance in the transformation of the South African energy sector: Critical success factors for environmental leadership. *Journal of Cleaner Production*, 154, 621-632.

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

Independent work of students includes:

- individual study of theoretical material on the subject of the course (links to information sources are presented in the previous sections);
- study of additional material;
- preparation of abstracts on the topics specified in the program.

11.1. Independent study of additional theoretical material is carried out by students on an individual basis; the list of recommended information sources is given above.

11.2. Requirements for writing abstracts

Academic ethics, respect for copyright. In the first lesson, students are informed about the need to comply with the norms of academic ethics and copyright during their studies. In particular, information is provided:

- general information about copyright;
- citation rules;
- link formatting rules

All footnotes in the text are carefully checked and provided with "addresses". It is not permissible to include in your work excerpts from the works of other authors without indicating this, to retell someone else's work close to the text without referring to it, to use other people's ideas without indicating the primary sources. This also applies to sources found on the Internet. You must specify the full site address. All cases of plagiarism must be excluded. If unjustified and incorrect borrowings are identified, the abstract is not accepted.

When preparing written works, the following must be submitted without fail: work plan; a list of used literature, drawn up in accordance with the current rules for the bibliographic description of used sources.

For the preparation of the abstract, only special relevant sources should be used. In addition to abstracts, the subject of which is related to the dynamics of any phenomena over many years, or the historical development of scientific views on any problem, sources should be used for a period of no more than 10 years.

The prepared essay should be presented at one of the classes in agreement with the teacher. Use of PowerPoint presentations (or those prepared using similar licensed or free software) is encouraged, but not required. The approximate time of the presentation is up to 15 minutes. The structure of the report and additional requirements for the quality of materials are determined by the chosen topic and are additionally discussed with the teacher.

12. Fund of appraisal funds for intermediate certification of students in the discipline (module) (developed in accordance with the requirements of the "Regulations for the formation of funds of appraisal funds", approved by order of the rector dated 05.05.2016 No. 420).

Department of Applied Ecology

APPROVED

at the meeting of the department

August 28, 2019, minutes No. 1

Head of the Department

_____ М.М. Redina

(подпись)

VALUATION FUND

ON THE EDUCATIONAL DISCIPLINE

MANAGEMENT OF ENVIRONMENTAL-ECONOMIC RISKS

direction 05.04.05 "Ecology and nature management"

Program:

Economics of natural resources management

Qualification (degree) of the graduate –

Master of Ecology and Nature Management

Passport of the fund of assessment tools by discipline

Direction 05.04.6 «Экология и природопользование»:

Discipline: MANAGEMENT OF ENVIRONMENTAL-ECONOMIC RISKS

Code Б1.В.05

12.1. Балльно-рейтинговая система оценки и характеристика шкалы оценивания

Rating assessment system and characteristics of the assessment scale

Балльно-рейтинговая система оценки и характеристика шкалы оценивания

Controlled competence code or part thereof Код контролируемой компетенции или ее части	Controlled discipline topic Контролируемая тема дисциплины	Forms of control ФОСы (формы контроля уровня освоения ООП)					Topic points Баллы темы
		Classroom work Аудиторная работа			Самостоятельная работа	Экзамен	
		Test / Тест	Test work Контрольная работа	Class work Работа на занятии	Report Доклад seminar report		
GPC- 4, 6 PC-1, 3	Introduction	X		10			4
GPC- 4, 6 PC-1, 3	Analysis and assessment of risk	X		12			4
GPC- 4, 6 PC-1, 3	Environmental risk and environmental projects	X		12			6
GPC- 4, 6 PC-1, 3	Management of risks in nature management	X		10			8
GPC- 4, 6 PC-1, 3	Minimization of environmental risks	X		12			10
	Exam Экзамен		15	56	15	14	

12.2 The maximum number of credits in the course is 3. At the same time, the following ratio is established between the number of points and the number of credits:

Points to credits ratio

Total points	Final assessment	Amount of credits
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

6. Deciphering of grades is also accepted according to the specified document:
7. - A: "Excellent" - the theoretical content of the course has been fully mastered, without gaps, the necessary practical skills for working with the material learned have been formed, all the educational tasks provided for by the training program have been completed, the quality of their implementation was assessed by the number of points close to the maximum.
 8. - B: "Very good" - the theoretical content of the course is mastered completely, without gaps, the necessary practical skills of working with the acquired material are basically formed, all the educational tasks provided for by the training program are completed, the quality of most of them is assessed by the number of points close to the maximum ...
 9. - C: "Good" - the theoretical content of the course has been mastered completely, without gaps, some practical skills of working with the mastered material are not sufficiently formed, all the educational tasks provided for by the training program have been completed, the quality of performance of none of them has not been assessed with a minimum number of points, some types of tasks have been completed with mistakes.
 10. - D: "Satisfactory" - the theoretical content of the course is partially mastered. but the gaps are not significant, the necessary practical skills to work with the acquired material are basically formed, most of the educational tasks provided for in the training program have been completed, some of the completed tasks may contain errors.
 11. - E: "Mediocre" - the theoretical content of the course is partially mastered, some practical skills have not been formed, many of the educational tasks provided for by the training program have not been completed, or the quality of some of them is assessed by the number of points close to the minimum.
- FX: "Conditionally unsatisfactory" - the theoretical content of the course has been partially mastered, the necessary practical skills have not been formed, most of the educational tasks provided for by the training program have not been completed, or the quality of their implementation was assessed by the number of points close to the minimum; with additional independent work on the course material, it is possible to improve the quality of completing educational tasks.
- F: "Certainly unsatisfactory" - the theoretical content of the course has not been mastered, the necessary practical skills are not formed, all the completed study tasks contain gross errors, additional independent work on the course material will not lead to any significant improvement in the quality of the study tasks.

12.3 List of competencies and stages of their formation

Nr.	Code and name of competence
1	GPC-4 Ability to apply normative legal acts in the field of ecology and nature management, norms of professional ethics
2	GPC-6 Ability to carry out critical analysis, apply a systems approach in the field of the digital economy
3	PC-1 the ability to formulate problems, tasks and methods of scientific research,

	generalize the results obtained, formulate conclusions and practical recommendations based on research results
4	PC-3 knowledge of the basics of design, expert and analytical activities and the implementation of research using modern approaches and methods, equipment and computing systems

12.4. Typical control tasks or other materials necessary to assess knowledge, skills, skills and (or) experience of activities, characterizing the stages of the formation of competencies in the process of mastering the educational program

Questions to prepare for certification

1. Briefly describe the environmental impact of the construction industry. What are the main procedures involved in environmental support at this stage?
2. What is environmental regulation? What types of standards are being developed for nature users?
3. Describe the place of environmental regulation in the design of economic activity and its environmental support.
4. How is the design of permissible plant emissions into the atmosphere carried out?
5. How is the design of permissible discharges of the enterprise into water bodies carried out?
6. How is the design of sanitary protection zones of enterprises carried out?
7. Give a definition of "risk". What types of risks are usually identified in management practice?
8. Give a brief description of the main stages of risk analysis.
9. What features can be named for environmental risk analysis procedures?
10. How are risks identified?
11. How is risk quantified? Give examples.
12. What methods are used to manage risks?
13. Give examples of project risks. How are these types of risks distributed across the stages of the project cycle?
14. Are there relationships between different types of project risks? Explain your answer with examples.
15. At what stages of the project are environmental risks characterized by maximum values?
16. What measures can be proposed to minimize project risks? How important it will be for the environment
17. Give a definition of environmental and economic risk. give examples.
18. Give the classification of environmental violations.
19. What methods are used to assess environmental and economic risks?
20. What are the main factors of environmental and economic risks.
21. How are different types of environmental risks quantified?
22. Give examples of quantitative estimates of the probability of accidents at hazardous facilities.
23. Describe the sources and factors of social risk from the point of view of environmental protection.
24. How is the scale of ecological risk for the territories assessed?
25. How is the level of life safety justified economically?
26. Describe the estimated socio-economic damage from the most dangerous natural phenomena on the territory of the Russian Federation

27. What are the specific features of environmental risks in the oil and gas industry?
28. Briefly describe the environmental risks at the exploration stage. How can they be reduced?
29. Give a brief description of the environmental risks associated with the exploitation of hydrocarbon deposits. Give examples.
30. Give examples of a quantitative assessment of environmental risks in the inland transport of hydrocarbons.
31. Give examples of a quantitative assessment of environmental risks in the external transport of hydrocarbons.
32. What environmental risks are typical for hydrocarbon storage facilities?
33. Give examples of environmental risks specific to hydrocarbon processing facilities.
34. How is a quantitative assessment of environmental risks at refinery facilities carried out?
35. Give examples of approaches to minimizing risks at oil refining facilities.
36. Give a description of the staging of accidents at hydrocarbon processing facilities.
37. List the main methods of risk management and give a brief description.
38. What risk management techniques can be applied to manage environmental risks?
39. Give examples of the implementation of risk management methods for the oil and gas industry.
40. Give a brief description of the environmental insurance system in the Russian Federation.
41. How is insurance rates justified?
42. What is risk management? Compare the concepts of "risk management" and "risk management".
43. How are environmental risks regulated in the risk management system?
44. Describe the potential for environmental risk management within environmental management systems.
45. What software tools are used to manage environmental risks?
46. Give a brief description of complex software tools for risk management in the field of environmental, industrial and occupational safety.
47. Assess the ecological and economic risk for the territory according to the available data
48. Calculate the economic assessment of damage from emissions (discharges) during emergencies in a given region according to available data

12.4. Methodological materials defining the procedures for assessing knowledge, skills, and activity skills, characterizing the stages of the formation of competencies).

The assessment of knowledge, skills and abilities is carried out using the components of the WCF presented in paragraphs. 12.1-12.34, in accordance with the sequence of acquisition of competencies indicated in table. p. 12.2.

The program is compiled in accordance with the requirements of the ES HE RUDN / FGOS HE.

Developers:

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подпись

инициалы>фамилия