

*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

### **ESTIMATIONS OF NATURAL RESOURCES**

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

The discipline **Estimations of natural resources** refers to an optional part of block 1 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<br>Economic valuation of natural resources<br>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 |
| <b>Classroom Lessons (total)</b>            |             |           |   |   |   |   |   |   |   |
| <b>Including:</b>                           |             |           |   |   |   |   |   |   |   |
| <i>Lectures</i>                             | 9           | 9         |   |   |   |   |   |   |   |
| <i>Practical lessons</i>                    | 9           | 9         |   |   |   |   |   |   |   |
| <i>Seminars</i>                             | -           |           |   |   |   |   |   |   |   |
| <i>Laboratory work</i>                      | -           |           |   |   |   |   |   |   |   |
| <i>Independent work</i>                     | 52          |           |   |   |   |   |   |   |   |
| Control                                     | 2           |           |   |   |   |   |   |   |   |
| The total labor intensity, hours.           | 72          |           |   |   |   |   |   |   |   |
| The total labor intensity, credits          | 2           |           |   |   |   |   |   |   |   |

#### 5. Discipline content

##### 5.1 Contents of discipline sections

| Discipline section name   | Section content (topics)   |
|---|--|
| 1. Introduction   | Natural resources in the nature management. Classifications of natural resources   |
| 2. Qualitative and quantitative evaluations of mineral resources    | Qualitative and quantitative evaluations of mineral resources, main criteria, indicators, approaches, problems and practice in the countries of the world    |
| 3. Qualitative and quantitative evaluations of water resources      | Qualitative and quantitative evaluations of water resources, main criteria, indicators, approaches, problems and practice in the countries of the world      |
| 4. Qualitative and quantitative evaluations of biological resources | Qualitative and quantitative evaluations of biological resources, main criteria, indicators, approaches, problems and practice in the countries of the world |
| 5. Qualitative and quantitative evaluations of energy resources     | Qualitative and quantitative evaluations of energy resources, main criteria, indicators, approaches, problems and practice in the countries of the world     |

##### 5.2\* Sections of disciplines and types of classes

| № п/п | Discipline section name  | Lectures | Practical lessons | Independent work | Total hours |
|-------|--|----------|-------------------|------------------|-------------|
| 1.    | Introduction   | 1        | 1                 | 10               | 12          |
| 2.    | Qualitative and quantitative evaluations of mineral resources    | 2        | 2                 | 10               | 14          |
| 3.    | Qualitative and quantitative evaluations of water resources      | 2        | 2                 | 10               | 14          |
| 4.    | Qualitative and quantitative evaluations of biological resources | 2        | 2                 | 10               | 14          |
| 5.    | Qualitative and quantitative evaluations of energy resources     | 2        | 2                 | 10               | 14          |

#### 6. Laboratory workshop (if available) - NO

## **7. Practical lessons; seminars**

| Nr | Discipline section   | Subjects of practical classes (seminars)   | Total hours |
|----|--|--|-------------|
| 1. | Introduction   | Classification of natural resources and their application in the natural resources management  | 1           |
| 2. | Qualitative and quantitative evaluations of mineral resources    | Features of mineral resources. Main types of mineral resources. Criteria for qualitative and quantitative evaluations of mineral resources     | 2           |
| 3  | Qualitative and quantitative evaluations of water resources      | Features of mineral resources. Main types of water resources. Criteria for qualitative and quantitative evaluations of mineral resources       | 2           |
| 4  | Qualitative and quantitative evaluations of biological resources | Features of mineral resources. Main types of biological resources. Criteria for qualitative and quantitative evaluations of mineral resources: | 2           |
| 5  | Qualitative and quantitative evaluations of energy resources     | Features of mineral resources. Main types of mineral resources. Criteria for qualitative and quantitative evaluations of energy resources      | 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](http://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](http://www.ecoindustry.ru) - site of the journal "Production Ecology";

[www.unep.org](http://www.unep.org) - site of the United Nations Environment Program;

[www.wwf.ru](http://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](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/](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-okruzhayushey-sredy-432790?share\\_image\\_id=#page/1](https://biblio-online.ru/viewer/normirovanie-i-snizhenie-zagryazneniya-okruzhayushey-sredy-432790?share_image_id=#page/1)
2. Leikin Yu.A. "Fundamentals of environmental regulation: Textbook. M.: Publishing house "Forum", 2018

## Additional list

- 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](http://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](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., Spitzer M., Christanell A. (2012): *Experiencing fuel poverty. Coping strategies of low-income households in Vienna/Austria*. <http://www.sciencedirect.com/science/article/pii/S0301421511009748>

### 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**

**ESTIMATIONS OF NATURAL RESOURCES**

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: **ESTIMATIONS OF NATURAL RESOURCES**

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 discipline topic<br>Контролируемая тема дисциплины | Forms of control<br>ФОСы (формы контроля уровня освоения ООП)    |                                 |                                 |  |                          | Topic points<br>Баллы темы |
|---|--|---------------------------------|---------------------------------|--|--------------------------|----------------------------|
|   | Classroom work<br>Аудиторная работа                              |                                 | Class work<br>Работа на занятии | Independent work<br>Самостоятельная работа | Examinations<br>Экзамены |                            |
|   | Test / Тест  | Test work<br>Контрольная работа |                                 |  |                          |                            |
| GPC-3, 4, 6, 8<br>PC-3, 5                                     | Introduction   | X                               |                                 | 10   |                          | 4                          |
| GPC-3, 4, 6, 8<br>PC-3, 5                                     | Qualitative and quantitative evaluations of mineral resources    | X                               |                                 | 12   |                          | 4                          |
| GPC-3, 4, 6, 8<br>PC-3, 5                                     | Qualitative and quantitative evaluations of water resources      | X                               |                                 | 12   |                          | 6                          |
| GPC-3, 4, 6, 8<br>PC-3, 5                                     | Qualitative and quantitative evaluations of biological resources | X                               |                                 | 10   |                          | 8                          |
| GPC-3, 4, 6, 8<br>PC-3, 5                                     | Qualitative and quantitative evaluations of energy resources     | X                               |                                 | 12   |                          | 10                         |
|   | <b>Exam<br/>Экзамен</b>  |                                 | 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   |
|     | General professional competencies   |
| 3   | OPK-3 Ability to use special and new sections of ecology, geocology and nature management in solving scientific research and applied problems of professional |

|   |   |
|---|---|
|   | activity  |
| 4 | OPK-4 Ability to apply normative legal acts in the field of ecology and nature management, norms of professional ethics   |
|   | OPK-5 Professional competencies (type of professional activity - research, control and expert, organizational and management)   |
|   | OPK-6 Professional competencies (type of professional activity - research, control and expert, organizational and management)   |
| 5 | PC-3 the ability to monitor compliance with environmental protection requirements, conduct environmental expertise of various types of design assignments, carry out environmental audits of any facility and develop recommendations for preserving the natural environment; organize and carry out work with statistical and reporting data |
|   | PC-5 the ability to monitor compliance with environmental protection requirements, conduct environmental expertise of various types of design assignments, carry out environmental audits of any facility and develop recommendations for preserving the natural environment; organize and carry out work with statistical and reporting data |

***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. Classification of natural resources
2. Dependence of humanity on natural resources and natural conditions
3. History of environmental crisis in the development of humanity
4. Modern problems of use of mineral resources
5. Modern problems of use of water resources
6. Modern problems of use of biological resources
7. Modern problems of use of energy resources
8. Main criteria for qualitative assessment of mineral resources
9. Main criteria for qualitative assessment of water resources
10. Main criteria for qualitative assessment of biological resources
11. Main criteria for qualitative assessment of energy resources
12. Main criteria for quantitative assessment of mineral resources
13. Main criteria for quantitative assessment of water resources
14. Main criteria for quantitative assessment of biological resources
15. Main criteria for quantitative assessment of energy resources

***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:**

Professor of the Department of Applied Ecology

**подпись**

**Khaustov A.P.**

**Head of the Department**

**applied ecology**

название кафедры

**подпись**

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