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**Federal State Autonomous Educational Institution  
Higher Education "Peoples' Friendship University of Russia"  
Institute of Environmental Engineering**  
(наименование основного учебного подразделения (ОУП)-разработчика ОП ВО)

## WORKING PROGRAM OF THE DISCIPLINE

### State Final Certification (GIA)

(наименование дисциплины/модуля)

### Recommended by MSTs for the direction of training / specialty:

05.04.06 Ecology and nature management  
08.04.01 "Construction"

(код и наименование направления подготовки/специальности)

**The development of the discipline is carried out within the framework of the implementation of the main professional educational program of higher education (EP HE):**

Environmental Engineering in Construction

(наименование (профиль/специализация) ОП ВО)

2024 г.

The work program of the state final certification was developed in accordance with the curriculum in the directions 05.04.005.04.06 Ecology and Nature Management, 08.04.01 Stroitelstvo (Master's degree) Specialization "Environmental Engineering in Construction" (Environmental Engineering in Construction).

## **1. General provisions**

1.1. Responsibility and procedure for preparing and conducting state final tests, as well as the list, sequence, and time frame for passing documents required for the implementation of state final certification between structural divisions, determines the Procedure for conducting final state certification of students.

1.2. The state final attestation on OP вHE includes a state interdisciplinary exam and the defense of the final qualification work in the form of a thesis.

1.3. The results of any of the types of certification tests included in the state final certification are determined by the grades "excellent", "good", "satisfactory", "unsatisfactory".

## **2. Goals and objectives of the state final certification**

2.1. **The purpose** of the state final certification is to determine the compliance of the results of students' development of basic educational programs with the requirements of the OS of Higher Education of the RUDN University.

The state final certification includes the state exam established by the Academic Council of the University and the defense of the final qualification work (WRC).

2.2. **The tasks** of the state final certification are:

checking the quality of personal training in basic natural science laws and phenomena necessary in professional activities;

determination of the level of theoretical and practical readiness of the graduate to perform professional tasks in accordance with the obtained qualification;

determination of the degree of a person's desire for self-development, improvement of their qualifications and skills;

verification of the formation of a stable motivation for professional activity in accordance with the types of professional activity provided for in the OS of Higher Education Institutions of the RUDN University;

testing the ability to find organizational and managerial solutions in non-standard situations and the willingness to take responsibility for them;

ensuring the integration of education and scientific and technical activities, increasing the efficiency of using scientific and technical achievements, reforming the scientific sphere and stimulating innovation;

ensuring the quality of training in accordance with the requirements of OS HE RUDN University.

The GIA evaluates the level of mastery of the following competencies:: OPK 2e; PC 1; PC 2; PC 5

## **3. Program of the state exam.**

3.1. The state exam is conducted in the form of testing and subsequent oral examination, which involves answers to "open" questions that require a short answer or a detailed explanation.

3.2. As part of the state exam, the degree of development of graduates of the following competencies is checked: OPK 2e; PC 1; PC 2; PC 5

3.3. Scope of the state exam:

- test part - 20 questions randomly selected from a database containing 200 questions; test part questions involve choosing one correct answer from 3 suggested options.

- oral part - 30 tickets containing 4 questions each, two of which are in the disciplines of the "Ecology and Nature Management" direction, two-in the disciplines of the "Construction" direction.

3.4. Content of the State exam:

*The approximate list of questions submitted for the state exam includes:*

1. Types of localities and settlements
2. Territorial settlement systems
3. Urban settlements, city criteria
4. Historical types of cities
5. Urbanisation and its stages
6. Geographical features of urbanisation
7. Historical layers of the city
8. Multifunctionality of cities
9. City as a system
10. City population
11. Economic basis of the city
12. City-forming industries
13. Urban service industries
14. Scope of support for the city
15. City planning structure
16. City planning framework
17. Global cities
18. Ecological framework of the city
19. Suburban area and its functions
20. Urban environment and its components
21. Environmental problems of cities
22. Economic problems of cities
23. Demographic problems of cities
24. Sustainable urban development
25. Ecological and analytical monitoring of the state of urban environmental components
26. Monitoring system for urbanized territories.
27. What are the main methods of risk analysis used to analyze the functioning of hazardous industrial facilities? Give examples.
28. What are the stages of risk analysis at hazardous industrial sites?
29. Main causes and consequences of accidents and incidents in pipeline transport.
30. Main causes and consequences of accidents in the chemical industry.
31. The main causes of accidents and incidents in transport.
32. Combinatorial index of water pollution and classification of water pollution by KMZ
33. Water Pollution Index (WPI). Characteristics of the integrated assessment of water quality by IZV.
34. Total pollution index  $Z_c$ . Classification of soil pollution level by  $Z_c$ .
35. Subject of study, tasks and role of ecology and geochemistry of urban landscapes in the ecology of the city. The role of landscapes in urban ecology.
36. Environmental situation in cities. Methodology of ecological and geochemical analysis of cities and urban landscapes.
37. Elementary landscapes. Basic concepts.
38. Three main groups of elementary landscapes (facies): eluvial, subaqual, supraqual.
39. Additional facies groups.
40. Definition of concepts, indexes of local landscapes. Their main characteristics.
41. Geochemical characteristics: types of chemical conjugations, ways and forms of migration of chemical elements.
42. Geochemical barriers and geochemical associations of elements, geochemical lattices, geochemical contrast.

43. Basic principles of typology of local landscapes.
44. Basic taxonomic units of the geochemical systematics of cities
45. Divisions, ranks, groups and types, families, classes, and genera of cities.
46. Geochemical systematics of urban landscapes.
47. Landscape and geochemical analysis of the state of cities.
48. Sources of urban landscape pollution, types of pollution, objects of pollution
49. Field landscape and geochemical studies.
50. Preparatory stage. Route research, key sections.
51. Description of the vertical profile of the local landscape and water bodies.
52. Processing of field research materials: Processing of analytical data Geochemical indicators.
53. Landscape and geochemical maps.
54. Main mechanisms of international cooperation. Contradiction of the basic principles of international law in the field of environmental protection. Levels of international environmental law.
55. UN International Environmental Conferences and their main outcomes. Rio 92, Johannesburg 2002, Rio 2012.
56. Convention on Biological Diversity. Goal, objectives, implementation mechanisms, results.
57. Framework Convention on Climate Change. Purpose of the convention. Interests and positions of major groups of countries. Conditions for ratification of the Kyoto Protocol and its obligations. Trading quotas. Current state of affairs.
58. International initiatives of UNESCO. The program "Man and the Biosphere". Concept of zoning a biosphere reserve. Convention for the Protection of the World Cultural and Natural Heritage. Cultural and natural criteria for classifying monuments.
59. The Ramsar Convention. Full name of the Convention. The uniqueness of the Convention, its purpose, and main objectives. Criteria for inclusion of sites in the list of wetlands of international importance. Comprehensive nature of the convention.
60. The CITES Convention. Full name of the Convention. Purpose and objectives of the Convention, its main requirements. Mechanisms for controlling international trade in species. Successes and failures of practical application. The principle of grouping plant and animal species in Annexes to the Convention.
61. The Berne Convention. Full name of the Convention. Purpose and objectives of the Convention. Security items. App Themes.
62. Convention for the Regulation of Whaling. Goal. Activities of the International Whaling Commission. A moratorium on commercial whaling.
63. The Aarhus Convention. Full name of the Convention. Principles of access to environmental information. Efficiency of practical application.
64. Non-governmental environmental organizations. IUCN. WWF. Specifics of each organization's activities and their mission. Main activities and achievements.
65. Current demographic situation in the world and individual regions and problems associated with them
66. Biological diversity and challenges related to the reduction of biological diversity in cities.
67. Environmental problems of large cities and possible solutions
68. Modern problems of park management.
69. Specially protected natural territories of cities.
70. Modern global environmental problems. Poverty as a source of urban environmental problems.
71. Resource and energy consumption in the city.
72. Modern problems of waste-free and low-waste technologies.
73. Main provisions of the concept of sustainable development

74. Briefly describe the history of environmental rationing and the main directions of environmental rationing.
75. The main directions of environmental regulation and the place of regulation of anthropogenic loads in the environmental management system.
76. The role of environmental regulation for standardization in the field of environmental protection? Development of environmental quality standards.
77. Brief description of the existing environmental rationing system in the Russian Federation. Interaction of Russian and foreign systems of environmental regulation.
78. What is city wastewater? What types of wastewater are subject to regulation and by what indicators?
79. What indicators are used to standardize the water quality of reservoirs and watercourses in the city?
80. How is the required degree of wastewater treatment calculated?
81. How is water consumption and discharge regulated in cities?
82. What is the standard of permissible impacts on water bodies?
83. What are the goals of rationing urban air impacts? What are the main indicators used in the system of normalization of impacts on the atmosphere?
84. What is the potential for atmospheric pollution? How is it calculated and used?
85. What is a sanitary protection zone? How is its size regulated in cities?
86. How are MPV standards calculated and approved?
87. Compare the definitions of "land", "soil", and "land resources". What is meant by the standard of land use?
88. What indicators are used to assess soil sustainability? What is an individual soil quality standard? Please provide examples of soil sustainability assessment.
89. Give a definition of waste. What are industrial waste and consumer waste? Please provide examples of waste classifications.
90. What is PNOOLR? How is it calculated?
91. How are waste hazard classes defined and for what purposes? What categories of enterprises are identified in terms of waste generation? Calculation of production waste generation standards.
92. Brief description of criteria for the state of vegetation and wildlife. Give examples.
93. Household toxicants and their impact on human health.
94. Construction toxicants and their impact on human health.
95. Production and use of food additives from the point of view of environmental toxicology.
96. The relationship of environmental toxicology with human ecology and environmental pathology.
97. The relationship between environmental toxicology and occupational health and safety.
98. Development of MPC standards for pollutants from the point of view of environmental metrology, toxicology and pathology.
99. Development of MPC standards for pollutants from the point of view of environmental metrology, toxicology and pathology.
100. System of state preventive measures for toxic lesions. Labor protection.
101. Assessment of workplaces from the point of view of environmental toxicology.
102. Main content of environmental engineering surveys
103. Organizational and legal basis of environmental engineering surveys
104. Goals, objectives and principles of environmental expertise
105. Examination procedure
106. Classification of objects of environmental expertise by sector of farms
107. Atmospheric impact assessment
108. Surface water impact assessment

109. Groundwater impact assessment
110. Assessment of geological and other natural processes by the nature of their negative impact on humans and ecosystems
111. Assessment of the impact on the soil cover. Resource criteria
112. Assessment of the impact on the soil cover. Geochemical criteria
113. Assessment of impacts on flora and fauna
114. Content of environmental engineering surveys in environmental design
115. Composition of environmental engineering surveys and content of the technical report
116. Environmental engineering surveys to support urban development projects
117. Geocological justification of environmental management licenses
118. Geocological justification of industrial facilities on the example of mining and processing of minerals
119. Geocological design of thermal power facilities
120. Geocological design of nuclear power facilities
121. Monitoring of radionuclide content in environmental objects, products and materials
122. Radiation safety standards NRB 99/2010
123. Determination of specific activity of radionuclides in food products
124. Radiation control of wood and scrap metal
125. Radiation control of building materials
126. Radiation and hygiene inspection of residential and public buildings.
127. Radiation monitoring of building sites
128. Radiation control of X-ray equipment
129. Occupational diseases caused by chemical and biological factors of the industrial environment.
130. Occupational diseases caused by physical factors of the industrial environment and vibration.
131. Assessment of labor process factors using the expert method.
132. Assessment of the physical factor of the urban environment: temperature regime and illumination.
133. Assessment of the physical factor of the urban environment: noise and vibration.
134. Assessment of chemical and biological factors of the urban environment.

#### **4. Methodological recommendations for the preparation and passing of the final state exam**

##### **4.1. Recommended literature**

The list of recommended literature is given in the programs of disciplines

##### **4.2. Additional recommendations**

When preparing for the state exam, it is possible to use software products, use Internet sources.

The use of computer equipment, printed materials, and communication devices is not allowed during the exam.

**5. Evaluation tools designed to establish during certification tests the compliance/non-compliance of the level of training of graduates who have completed the development of OP HE in the field of training with the requirements of the corresponding OS of Higher education of the RUDN University/Federal State Educational Standard of Higher Education.**

*- The list of competencies that students should master as a result of mastering the educational program:*

*As a result of mastering the master's program, the graduate should have developed universal, general professional and professional competencies.*

OPK 2e. Able to use special and new sections of ecology, geocology and nature management in solving scientific research and applied tasks of professional activity..

PC 1. It is able to conduct expert analysis of design solutions for industrial and civil construction projects, including those in the field of environmental management.

PC 2. It is able to diagnose environmental problems, develop standard environmental measures and practical recommendations for ensuring sustainable development, and assess the impact of planned structures or other forms of economic activity on the environment.

PC 5. Able to develop design solutions and organize design in the field of industrial and civil engineering.

*Standard tasks or other materials required to evaluate the results of mastering the program educational programs, - are presented in the programs of disciplines.*

*Methodological materials that determine the procedures for evaluating the results of mastering an educational program are presented in the programs of disciplines.*

### **Criteria for assessing students ' knowledge based on the results of passing the state exam**

When evaluating the results of an interdisciplinary exam, a 100-point score is used. The results of the state exam are determined by the grades "excellent", "good", "satisfactory" or "unsatisfactory". A student who receives an unsatisfactory rating is considered to have failed the state exam.

When evaluating a graduate's response, the number and nature of errors (significant or non-significant) are taken into account. Members of the state examination commission give points for each question (task), according to Table 1.сно таблице 1.

**Table 1.** Structure of the point-rating assessment of the state exam:

<b>#</b>	<b>Content of the state exam component</b>	<b>Number of points maximum</b>
1	Testing according to the program	25
2	Theoretical question #1 (disciplines from the basic part of the curriculum)	25
3	Theoretical question #2 (subjects from the variable part of the curriculum)	25
4	Theoretical question #3 (elective subjects from the variable part of the curriculum)	25
<b>TOTAL</b>		<b>100</b>

The amount of points received at the state exam is transferred to the assessment and category according to the international scale ECTS-European Credit Transfer and Accumulation System (European system of transfer and accumulation of points):

- "excellent", category A-from 96 to 100 points.
- "excellent", category B-from 86 to 95 points.
- "good", category C-from 69 to 85 points.
- "satisfactory", category D-from 61 to 68 points.
- "satisfactory", category E-from 51 to 68 points.

- "unsatisfactory", FX category-from 31 to 50 points.
- "unsatisfactory", category F-from 0 to 30 points

Criteria for evaluating the answer to test and theoretical questions (assessment of knowledge):

- **25 points** are awarded to the student for an exhaustive answer to the ticket question in this block, demonstration of theoretical knowledge, ability to generalize and draw correct conclusions and concretize the material using appropriate examples.
- **20-24 points** are awarded to the student if the answer is not sufficiently complete and not sufficiently detailed, but the student has shown a fundamental ability to think logically and concretize generalized knowledge, proving their main points by examples. Writing requires corrections and corrections.
- **15-19 points** are awarded to a student who answered the proposed questions not completely, but without gross errors, and showed basic knowledge of the basic concepts of the discipline in accordance with the mandatory course program and recommended basic literature.
- **10-14 points** are awarded to the student if an incomplete answer is given, which is a disparate knowledge of the topic of the question with significant errors in definitions. There is fragmentary, illogical presentation. The student is not aware of the connection of this concept, theory, phenomenon with other objects of the discipline. There are no conclusions, concretization and evidence-based presentation, and the written language is illiterate.
- **less than 9 points** are awarded to the student if there is no answer relevant to the question.

## 6. Requirements for the final qualification work

**6.1.** A student who has passed the state exam is allowed to defend the thesis. The defense of the thesis is held at an open meeting of the State Examination Commission (GEC).

The state final certification is conducted in the form of an oral presentation of the thesis, followed by oral answers to questions from members of the HEC in accordance with the University's Regulations on the thesis. The report and / or answers to the questions of the members of the HEC may be in a foreign language.

**6.2. As part of the defense of the thesis, the degree of development of the following competencies by graduates is checked:**

- OPK 2e; PC 1; PC 2; PC 5

### List of approximate topics of theses :

- Dynamics of the state of urban landscapes (for example)
- Ecological state of the city's protected areas (for example)
- Protection from underground water pollution in an urban area (as an example)
- Environmental assessment of the impact of transport on the city's environment (by example)
- Dynamics of protective green belts of cities according to данньм to remote sensing data (for example)
- Comparative characteristics of the chemical composition of the waters of small and large rivers in cities
- Environmental optimization of production facilities (as an example)
- Ecological and economic efficiency of enterprises ' activities (on the example of enterprises by economic sectors)
- Hydrogeological consequences of technogenesis on the territory of a city (as an example)
- Влияние Impact of construction on the ecological state of the adjacent territory
- Population dynamics and socio-ecological problems of small towns



- Population dynamics and socio-ecological problems of the megalopolis
- Environmental assessment of the construction waste management system
- Ecological and economic aspects of energy saving in cities
- Ecological and economic justification of energy saving technologies
- Environmental and economic justification of environmental protection measures (on the example of an enterprise/ organization)
  - Evaluation of the effectiveness of the environmental management system of an enterprise/ organization
    - Ways to reduce and neutralize air-gas emissions from wastewater treatment plants
    - Environmental risks at hydrocarbon storage facilities
    - Ecological and economic assessment of plans for the prevention and elimination of emergency oil and oil products spills at oil storage facilities in cities
    - Ecological and economic assessment of plans for the prevention and elimination of accidental oil and oil products spills in the water areas of water bodies
    - Analysis of environmental risks of metalworking enterprises
    - Ecological and economic justification of the use of various types of sorbents for oil collection
    - Ecological and economic aspects of the introduction of green building technologies
    - Geocological conditions of the territory and calculation of landslide slope stability
    - Impact of seismic events on the ecological well-being of the city (By example)
    - Hazards of exogenous geological processes in urban areas.
    - Zoning of a city based on a set of geocological indicators.

**6.3. Tasks that the student must solve in the course of completing the thesis:**

- 1) in-depth analysis of literature sources on the subject of research;
- 2) independent formulation of research goals and objectives;
- 3) application of theoretical knowledge and practical skills, a set of acquired competencies for the analysis of the research object;
- 4) independent execution of calculations, including the use of specialized software packages, if this is provided for by the focus of work;
- 5) interpretation of calculation results;
- 6) drawing conclusions based on the results of the work;
- 7) presentation of work results.

**6.4. Stages of completion of the final qualification work (WRC),**

The procedure for organizing, performing, monitoring, and defending a Master's thesis is reflected in the Rules for preparing and performing the final qualification work of a RUDN University graduate.

The final qualification work of the master's degree is carried out by the student under the supervision of a professor or associate professor of the graduating department in agreement with the program manager.

Work on the master's thesis is carried out in the following stages:

1. Definition of the master's thesis topic.
2. Approval of the topic and head of the master's thesis at the department meeting
3. Drawing up a task and a calendar schedule for completing the master's thesis with an indication of specific deadlines for its phased implementation.
4. Preparation of materials to substantiate the research topic, set goals and objectives, determine research methods and structure of the dissertation. Conducting the first stage of preliminary defense in the form of a report at a meeting of the department .
5. Study of theoretical material, regulatory documentation, statistical data on the chosen topic, justification of the research methods used. Conducting the second stage of preliminary defense in the form of a report at a meeting of the department.

6. Conducting scientific and design and production research on the chosen topic. Based on the results of the conducted research, a report on the implementation of research is filled in and the corresponding assessment is made by the supervisor in the statement and in the student's credit book.

7. Passing a mandatory pre-graduate internship in order to complete the final qualification work (WRC). The assignment for pre-graduate practice is issued by the head of the master's thesis.

8. Based on the results of scientific and design-production research and pre-graduate practice, the third and final stage of pre-defense is held in the form of a report at a meeting of the department.

9. Completion of the thesis in accordance with the requirements of the Federal State Educational Standard.

10. Submission of the thesis in the format of a master's thesis to the supervisor for final review and receiving feedback.

11. Review of the thesis on the subject and amount of borrowings in the RUDN Anti-Plagiarism system, obtaining a certificate.

12. Translation of the report and presentation into a foreign language under the supervision of the curator of the Department of Foreign Languages of the Faculty of Ecology.

13. Receiving a review of a master's thesis.

14. Obtaining admission to the defense at the graduating department.

15. Placement of the electronic version of the master's thesis in pdf format in the RUDN University electronic library system.

16. Transfer of the completed thesis with the review of the supervisor, review and reference of the RUDN University Anti-Plagiarism system on the amount of borrowings to the state examination commission.

17. Defense of the Master's thesis at an open meeting of the state examination commission.

18. The defense of the master's thesis is carried out in the form of an author's report, which takes up to 15 minutes.

All master's theses, regardless of the program and form of study, are subject to mandatory verification in the RUDN University Anti-Plagiarism system. The share of the author's text (originality) as a result of automated verification by the RUDN Anti-Plagiarism system in the master's thesis should be at least 70 %.

The results of automatic analysis of the master's thesis in the form of a certificate of the degree of originality formed in the RUDN University Anti-Plagiarism system are subject to analysis by the supervisor and are reflected by him in the conclusion on the degree of originality of the final qualification work. The review of the WRC supervisor reflects the supervisor's reasonable opinion on the quality of the WRC.

The text of the master's thesis, with the exception of the text containing information constituting a state and commercial secret, is placed in the RUDN University electronic library system.

The Master's thesis is subject to review in accordance with the Rules for preparing and completing a graduate thesis of RUDN University. For reviewing, the master's thesis is sent to one or several reviewers from among persons who are not employees of the RUDN University or the organization where the work was performed, where the work was performed. The reviewer analyzes the master's thesis and submits a written review.

Structure of the Master's thesis

The requirements for the structure, scope, content, and design of the master's thesis and abstract are uniform for the training areas of 05.04.06 "Ecology and Nature Management" and 08.04.01 "Construction", regardless of the training program, and are reflected in the Rules for preparing and completing the Graduate thesis of RUDN University.

## 6.5 Requirements for the content of the Master's thesis

The final master's thesis must fully correspond to the approved topic. According to the structure, the content of the master's thesis must meet the following requirements.

### **Title page**

The title page is the first page of the Master's thesis and is filled in according to the form given in the Rules for preparing and completing the Graduate Thesis of RUDN University (Appendix 2), approved by the head of the work, section consultants, and signed by the head of the graduating department.

### **Content**

The content should include the names of all sections and subsections of the work with an indication of the page at the beginning of each part. The names of sections and subsections in the content should strictly correspond to their names in the text of the work. The content is given at the beginning, which makes it possible to immediately see the structure of the work.

### **Introduction**

The introduction of the work should contain an assessment of the current state of the problem being solved and its relevance, justification for the need for work, formulation of the research goals and objectives, description of the scientific novelty and practical significance of the work, the main provisions submitted for defense, the results of approbation of the work, and the structure of the work.

**Relevance of the topic.** The degree of development, the need for research for the development of the relevant branch of science or production, or the region is indicated.

**Purpose and objectives** of the study. The goal of the work and the tasks that need to be solved in order to achieve this goal are formulated. The goal and objectives are a vector that sets the direction of work and disclosure of the chosen goal by the applicant. As a rule, the goal of the work is consistent with the name of the research topic. The number of tasks assigned usually coincides with the number of chapters in the master's thesis, and the titles of the chapters should reflect the content of the task.

**Scientific novelty** of the results obtained. When presenting the novelty of the study, it is necessary to show the difference between the results obtained and the known ones, describe the degree of novelty (first obtained, improved, given further development, etc.).

**Practical significance** of the results obtained. The results of practical use of the obtained research results or recommendations for their use are given (the development of practical recommendations may be one of the research tasks). The main provisions of the work submitted for defense. The main scientific and practical results obtained in the dissertation research are presented. The master's student must clearly formulate the provisions submitted for defense.

**Approbation** of the results of the author's dissertation and publication. It is indicated at which conferences, meetings, seminars, etc. the results of research included in the work were reported; in which literary sources the results of the work were published (indicating the publication status (impact factor), indexability in international (Scopus, Web of Science) and domestic (RSCI, HAC) databases).

Structure and scope of work. The structure of the work, the presence of an introduction, a certain number of chapters, appendices, a list of used literature from....sources, the total number of tables and figures.

The main content of the work should include the required number of chapters (in accordance with the number and content of the tasks set). The first chapters of the study (one or two) are a literature review, including the main conclusions made during the review, the next chapter is devoted to the description of the methods and objects of research used, and the final chapter is the results obtained and their discussion. In the conclusion of the master's thesis, the main conclusions and, if necessary, practical recommendations are formulated.

## 6.6 Evaluation tools.

### 3.5 Evaluation criteria for the final Master's thesis

КачThe quality of the completed final qualification work (WRC) in the form of a graduate's master's thesis is evaluated by the State Attestation Commission, as the result of the author's report to the SAC members.

The Commission takes into account the independence of the research, the logical structure of the presentation, the correctness of setting goals and objectives, the correctness of conclusions and their compliance with the tasks set, the quality of the text and report, as well as the quality of the prepared presentation. The assessment made by members of the State Attestation Commission also takes into account the number and nature of errors (significant or insignificant), the degree of knowledge of the material, the quality and correctness of answers to questions. Based on the results of the thesis defense, members of the State Examination Commission give points, while the score is given by each member of the state examination Commission, and the final score is given collectively, taking into account the ratings of all members of the SAC.

МакThe maximum score for the submitted thesis is **100 points** (approved by the Decision of the ISSN and the Academic Council of the Faculty). For evaluation criteria, see the table below.

#	Evaluated component	Score in points
1.	Content of the final qualification work: novelty, relevance, availability of graphic material, compliance of conclusions and proposals with the content of the work	60
2	Design of the final qualification work: design of text and graphic material in accordance with GOST	10
3	Availability and quality of the presentation reflecting the main provisions and conclusions of the final qualification work	10
4	Quality of the report, compliance with the regulations	10
5	Knowledge of the research material: quality of answers to questions on the topic of the final qualification work	10
	<b>TOTAL</b>	<b>100</b>

The sum of points obtained during the defense of the final qualification work (WRC) is converted into an assessment in accordance with the International Rating System ECTS and the Regulations on the Point Rating System (BRS) of the RUDN University:

- excellent – from 96 to 100 points (A).
- very good from 86 to 95 points (B)
- Good – from 69 to 85 points (S).
- satisfactory – from 61 to 68 points (D).
- satisfactory – from 51 to 60 points (E).
- unsatisfactory – from 50 to 31 points (FX), the thesis requires further development and can be defended in accordance with the regulations .
- unsatisfactory – 30 or less points, the thesis requires a complete revision.

#### 3.5.1 Criteria for evaluating the content of the final qualification work

**45-60 points** are awarded if the work is a logically completed, independent study, is devoted to solving current problems taking into account modern achievements of science and technology; is

based on modern scientific concepts and approaches, regulatory documents; is original, includes elements of novelty; the work is widely presented graphic material, conclusions and suggestions fully correspond to the content jobs.

**30-44 points** are awarded if the work is a completely logically completed, independent study, is devoted to solving current problems, takes into account modern achievements of science and technology; is based on modern scientific concepts and approaches, regulatory documents; includes elements of novelty; the work presents graphic material, conclusions and suggestions do not fully correspond to the content of the work.

**15-29 points** are awarded if the work is not a completely logically completed study; the work does not take into account modern achievements of science and technology; the work contains elements of novelty; the graphic material is presented in limited or absent form, conclusions and suggestions do not fully correspond or do not correspond to the content of the work.

**1-14 points** are awarded if the work is a logically incomplete study; the work does not take into account modern achievements in science and technology; there are no novelty elements in the work; there is no graphic material, conclusions and suggestions do not correspond to the content of the work and the tasks set.

**0 points** are awarded if the final qualifying work is completely absent.

### **3.5.2 Criteria for evaluating the completion of the final qualification works (design of text and graphic material in the form of in accordance with GOST)**

**16-20 points** are awarded if the work is done in full compliance with the guidelines; the text is carefully designed, there are no grammatical errors, the bibliographic list is designed in accordance with GOST; the graphic material and illustrations are high-quality; the work is bound.

**11-15 points** are awarded if the work is not performed in full compliance with the guidelines; the bibliographic list is designed in accordance with GOST; the work is bound; graphic material and illustrations are made in color.

**6-10 points** are awarded if the work is not performed in full compliance with the guidelines; the bibliographic list is not designed in accordance with GOST; the work is bound; graphic material and illustrations are made in color.

**1-5 points** are awarded if the work is not performed in full compliance with the guidelines; the bibliographic list is not designed in accordance with GOST; the work is not bound; graphic material and illustrations are missing or their quality does not allow you to get the necessary information.

**0 points** – if there is no final qualification work at all.

### **3.5.3 Presentation evaluation criteria**

**16-20 points** are awarded if all parts of the presentation are related to the goal and subject of discussion. The results of the study are summarized in order to draw important and meaningful conclusions on the topic of the presentation. The presentation is based on key points and fully reveals the topic. The author demonstrates fluency in professional terms when disclosing tasks. There are no grammatical errors. There are graphic illustrations, statistics, charts, graphs, and comparison examples. The thematic sequence is maintained. Readable font, correctly selected color (no more than three). Images, videos, and audio are used.

**11-15 points** are awarded if all parts of the presentation contain important statements on the topic. The results of the study are summarized in order to draw conclusions on the topic of the

presentation. The presentation is based on several key points that do not fully cover the topic. It demonstrates the use of professional terms in the disclosure of assigned tasks. There are practically no grammatical errors. Graphic illustrations, statistics, charts, graphs, and comparison examples are not fully presented. The thematic sequence is maintained. The font is readable and the color is correctly selected. Images and videos are used.

**6-10 points** are awarded if the main parts of the presentation contain important statements on the topic, but some fragments are not related to it. Some conclusions are illogical or unfounded. Presentations contain key points, but they are unnecessarily verbose or devoid of information. There is some difficulty in choosing words and some inaccuracies in their use. Errors are allowed that make it difficult to understand. The thematic sequence is maintained. The font is readable and the color is correctly selected. Images and videos are used.

**1-5 points** are awarded if the presentation has a topic, but many parts of it are not related to the topic. The conclusions are missing or illogical. Key points are not highlighted. Numerous errors are made that make it difficult to understand. There is no illustrative material.

**0 points** – if there is no presentation at all.

#### **3.5.4 Report evaluation criteria**

**16-20 points** are awarded if the report makes a good impression, is accompanied by illustrative material in which the author was well-versed, argues his point of view, shows the possession of a special apparatus, and fully characterizes the work.

**11-15 points** are awarded if the report is clearly structured, the demonstration material used in the report is well designed, but there are inaccuracies, the conclusions are poorly reasoned and indistinctly characterize the work, uses general scientific and special terms.

**6-10 points** are awarded if the report is told, but the essence of the work is not explained, the presented demonstration material was not used by the speaker or is poorly designed, illiterate, there is no logic in presenting the material, uses basic concepts and terms, conclusions are available, but not proven.

**1-5 points** are awarded if the report is read out, the essence of the work is not explained, the presented demonstration material was not used by the speaker or is poorly designed, illiterate, the author makes gross mistakes, there is no logic in presenting the material, terminology is used incorrectly, and conclusions are not correct.

**0 points** are awarded if there is no presentation at all.

#### **3.5.5 Criteria for evaluating responses to graduation questions qualification work**

**16-20 points** are awarded if the student answers all the questions in a reasoned manner, and the student is shown to be proficient in a special device.

**11-15 points** are awarded if the student gives poorly reasoned answers to a number of questions, uses general scientific and special terms.

**6-10 points** are awarded if the student cannot answer the questions clearly, but uses basic concepts and terms

**1-5 points** are awarded if the student answers questions incorrectly or gives an undocumented answer, does not know the terminology, uses common terms instead of special ones, but

understands the meaning of the questions asked

**0 points** – if the questions are completely unanswered and completely misunderstood.

The student has the right to file a written appeal to the appeal commission about a violation, in his opinion, of the established procedure for defending the final qualification work.

The program is designed in accordance with the requirements of OS VO.

**Developers**

Associate Professor of the Department  
Environmental management system



**D. E. Kucher**

**Program Manager**

Department Director  
Rational use of natural resources



**D. E. Kucher**