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**Federal State Autonomous Educational Institution of Higher Education "Peoples'
Friendship University of Russia"**

Agrarian-Technological Institute

(name of the main training unit (PMO)-developer of the EP HE)

**PROGRAM
STATE FINAL CERTIFICATION**

(name of discipline/module)

Recommended by ISSS for the direction of training/specialty:

35.04.03. "Agronomy"

(code and name of the direction of training/specialty)

**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):**

Agronomy, "Integrated Plant Protection"

(name (profile/specialization) ep he)

2022

1.1. The responsibility and procedure for the preparation and conduct of state final tests at RUDN University, as well as the list, priority, timing of the passage of documents necessary for the implementation of the state final certification, between structural units determines the Procedure for conducting the final state certification of students.

1.2. State final certification in the direction of 35.03.04. "Agronomy" specialization "Integrated plant protection" includes a state exam and the defense of the final qualification work in the form of a public defense of a master's 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 the development of the main educational programs by students with the requirements of the ES HE RUDN / FSES HE.

The state final certification includes a 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 final certification are:

- verification of the quality of personal education in the basic natural science laws and phenomena necessary in professional activity;
- determination of the level of theoretical and practical preparedness of the graduate to perform professional tasks in accordance with the qualification received;
- establishing the degree of aspiration of the individual to self-development, improving his qualifications and skills;
- verification of the formation of a stable motivation for professional activity in accordance with the types of professional activity provided for by the ES HE RUDN /FSES HE;
- testing the ability to find organizational and managerial solutions in non-standard situations and readiness to take responsibility for them;
- ensuring the integration of education and scientific and technical activities, increasing the efficiency of using scientific and technological achievements, reforming the scientific sphere and stimulating innovation;
- ensuring the quality of training in accordance with the requirements of the OS HE RUDN /FSES HE.

3. State exam program.

3.1. The state exam is conducted in writing, Students are advised to prepare their answers on the exam card in writing.

3.2. As part of the state exam, the degree of mastery of graduates of the following competencies is checked:

General cultural competencies:

- the ability to abstract thinking, analysis, synthesis; the ability to abstract thinking, analysis, synthesis; the ability to abstract thinking, analysis, synthesis.

General professional competencies:

-readiness for communication in oral and written forms in Russian and foreign languages to solve the problems of professional activity

- willingness to lead the team in the field of their professional activities, tolerantly perceiving social, ethnic, confessional and cultural differences

-the ability to use and apply in-depth theoretical and practical knowledge in the field of fundamental informatics and information technology

- the ability to independently acquire and use in practical activities new knowledge and skills, including in new areas of knowledge not directly related to the field of activity, to expand and deepen their scientific worldview

-the ability to use in-depth knowledge of legal and ethical standards in assessing the consequences of their professional activities, in the development and implementation of socially significant projects

Professional competencies:

- ability to teach mathematical disciplines and informatics in educational organizations of basic general, secondary general, secondary vocational and higher education
- the ability to develop educational and methodological materials on the subject of information technology for educational organizations of secondary vocational and higher education, to conduct seminars and practical classes with students, as well as lecture classes of special courses
- ability to develop educational and methodological complexes for e-learning and mobile learning
- ability to develop analytical reviews of the state of the field of applied mathematics and information technology
- the ability to perform the work of experts in departmental, sectoral or state expert groups for the examination of projects, the subject of which corresponds to the focus (profile) of the master's program
- ability to work in international projects for the development of open specifications of new information technologies, implemented by international professional organizations and consortia on the basis of the consensus principle
- the ability to participate in the activities of professional network communities in specific areas
- the ability to realize the corporate policy in the field of increasing the social responsibility of business to society, to take part in its development

3.3. **The evaluation of computer testing** is carried out on a 100-point scale. At the same time, a student who scores less than 50 points is considered to have received a "non-pass" - a score of "unsatisfactory and is not allowed for further final final tests. The student's receipt of at least 50% of the points of the total number of points is admission to the main part of the state exam. The Academic Council of the Institute (or decisions of higher bodies) may establish other, more stringent requirements for obtaining a grade of "offset" ("satisfactory").

The volume of the written part of the state exam: There are 111 questions in total. Tickets for the exam are formed from the questions included in the State Final Certification Program and there are 37 of them. 150 minutes are given for the examination work Each ticket contains three questions. The completeness and correctness of the answer, the literacy of the presentation are evaluated. The maximum score for each question is 33. The maximum number of points for the exam is 100.

The final score for the state exam consists of the assessment of the written part and the test part of the exam. At the same time, the maximum score of the test part is 10 points.

3.4. **Content of the state exam:**

Questions for the state exam (magistracy)

1. What issues does agricultural microbiology study?
2. What are epiphytes
3. What applies to abiogenic substrates of microorganisms
4. What signs distinguish a bacterial cell from a eukaryotic cell
5. What microorganisms have a prokaryotic cell structure
6. What substrates of microorganisms are classified as abiogenic
7. What ensures the mobility of bacteria
8. Mandatory internal structures of a bacterial cell
9. The main functions of the cytoplasmic membrane
10. Basic methods of coloring microorganisms
11. Which of the dyes is most often used to color microorganisms
12. Optimal mode of cultivation of phytobacteria

13. The reason for the manifestation of pathogenic properties of conditionally pathogenic phytobacteria
14. The main sources of primary infection in phytobacteriosis
15. The main ways of penetration of phytobacteria into plant tissues
16. Which of the genera of phytobacteria belong to the department Firmicutes
17. Which of the genera of phytobacteria are spore-forming
18. The most common method of sterilization of nutrient media
19. What nutrient media are preferable to use for the isolation of phytobacteria of the genus *Pseudomonas*
20. What type of disease is caused by phytobacteria of the genus *Erwinia*
21. What disease does the bacterium *Xanthomonas campestris* pv. *campestris* cause?
22. What disease does the bacterium *Pseudomonas syringae* pv. *lachrymas* cause?
23. What disease is caused by the bacterium *Clavibacter michiganensis* subsp. *michiganensis*
24. What type of animals do phytonematodes belong to?
25. To which class of living organisms phytonematodes belong
26. In what environments does the development of phytoparasitic nematodes occur?
27. Name the type of reproduction of phytonematodes
28. How many larval stages do phytonematodes go through during development
29. Which of the genera of phytonematodes belongs to the leaf parasites
30. Specify the systematic name of the chrysanthemum leaf nematode
31. What symptoms are observed when plants are affected by leaf nematodes
32. Which of the genera of nematodes belong to the stem
33. Specify the systematic name of the stem (tuberous) potato nematode
34. Which of the species of phytoparasitic nematodes belongs to the group of sedentary root nematodes
35. Representatives of what kind belong to the group of gall-forming nematodes
36. Symptoms of meloidogynosis
37. What species belongs to the root cyst-forming nematodes
38. The main symptoms of potato globederosis
39. Symptoms of damage to citrus crops by a nematode
40. Representatives of which genus of nematodes belong to the group of migrating root
41. Specify the type of phytohelminth that lives in the body of insects
42. To which group of pesticides belong plant protection products against phytoparasitic nematodes
43. What group of pesticides, according to their chemical structure, is allowed for use in the territory of the Russian Federation to protect plants from phytohelminths
44. What is the sedimentation coefficient characteristic of viruses?
45. Name the value of g used to deposit viruses

46. Specify the density of virus particles in g/cm
47. What technological processes are used to concentrate viruses
48. What properties of viruses characterize them as inanimate matter
49. Which form of virus particles is more effective for diffusion
50. What techniques can increase the yield of viral mass from plant material
51. What factors affect the possibility of electrophoretic differentiation of viruses
52. What is the chemical composition of plant viruses
53. Under what conditions is the solubility of viruses preserved?
54. What affects the possibility of reproduction of the virus in the cell
55. What optical methods can be used to determine the presence of viruses in the solution?
56. What factors contribute to the inactivation of viruses in the inoculum
57. Under what conditions are the immunogenic properties of invitro viruses preserved with the loss of infectivity?
58. Under what conditions is the precipitation effect on viruses reversible, i.e. their reversibility is preserved
59. With what methods of contact of viruses with the cell their penetration into the cell does not occur
60. In what cases sick plants are not able to become infected with viruses
61. What is a persistent infection?
62. What is the probable origin of viruses
63. What is the difference between viruses and mycoplasmas
64. What is the role of resistant varieties
65. What determines the specialization of the pathogen
66. List the anatomical and morphological factors of resistance
67. What is the biological "immunization"
68. What is meant by plant immunity
69. What are the mechanisms of variability of the body, which contribute to the emergence of new hereditary traits and properties of stability in it
70. What are the possible ways of formation of physiological races
71. The Importance of Conjugate Evolution in Immunity
72. What methods are used to identify resistant varieties?
73. What is the role of plant enzyme systems in immunity?
74. The main agrotechnical methods of increasing the endurance (resistance) of plants to pathogens
75. Ways to create plants that remain resistant for a long time
76. What are the manifestations of active plant immunity
77. What is characteristic of the hypersensitivity reaction
78. What can be attributed to the factors of passive immunity

79. The main physical and chemical factors of stability
80. Methods of chemical immunization
81. What affects the objectivity of the assessment of plants on the basis of sustainability
82. What properties are characteristic of acquired immunity
83. How to increase resilience
84. Factors contributing to the manifestation of false stability
85. What agricultural techniques determine the tolerance of plants to damage
86. What determines the manifestation of plant resistance to pests
87. Factors characterizing the aggressiveness of the pathogenic
88. What affects pathogenic virulence
89. Distinctive properties of phytoalexins
90. What determines the specificity of the immunological reaction of the plant
91. Methods for creating plant varieties resistant to pathogens
92. What processes lead to hereditary changes in viruses
93. What determines the manifestation of the selectivity of pests when choosing a fodder plant
94. What are the weaknesses of the theories explaining the manifestations of immunity?
95. What affects the frequency of inherited stability variability
96. What determines the variability of virulent properties of pathogenic
97. Basic properties of polygenic varieties
98. The concept of the threshold of harmfulness and the economic threshold of harmfulness.
99. Medium resistance. Survival curves.
100. Structural model of J. Van der Planck.
101. The model of the epiphytotic process and the resulting two problems of the ISR.
102. 4 phases of the epiphytotic process.
103. The concept of environmental equivalents. 4 groups and 10 subgroups, examples.
104. Methods of isolation and accounting of fungal pathogens from the soil
105. Methods of accounting for phytophages.
106. Weed accounting.
107. Phytopathological examination of seeds.
108. The main theories that treat the impact of various factors on the population.
109. Main types of population dynamics models
110. System of protective measures on grain crops

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

4.1. Recommended reading:

1. Bey-Bienko G.Y. Obshchaya entomologiya: Uchebnik-Spb : «Prospekt nauki», - 2008.- 486
2. Protection of plants from pests / Ed. by N. N. Tretyakov, V. V. Isaichev. St. Petersburg, Moscow - Krasnodar. - 2012.- 528 p.
3. Plant quarantine / Ed. by A.S.Vasyutin M., 2002 - 536 p.

4. List of pests, pathogens of plant diseases, weeds of quarantine importance for rf.MSH, 2003. -6c.
 5. Biology of quarantine harmful organisms (weeds, pests and diseases) [Electronic resurs]: kurs leksiï / sost. O. B. Kotelnikova. -Kursk: izd-vo KSAA, 2008. -160s.
 6. Phytosanitary control and supervision in the Oryol and Kursk regions / Under the general editorship of E. N. Dubrovin. –Orel: LLC PF "Operative Polygraphy", 2008.-461s.
- Additional literature
1. Alexandrov, I.N. Diplodiosis of corn / I.N. Alexandrov, I.P. Dudchenko // Protection and quarantine of plants. -2002.-No 1.-P.24.
 2. Baranchikov, Yu.N. Complex monitoring of the population of the Siberian silkworm / Yu.N. Baranchikov, Yu.P. Kondakov, V.M. Petko // Protection and quarantine of plants. -2006.-No 5.-P.39.
 3. Vasyutin, A.S. Plant Quarantine in the Russian Federation / A.S. Vasyutin, A.I. Smetnik, Y.B. Mordkovich and others. - M.: Kolos, 2001.- 375 p.
 4. Harmful organisms of quarantine importance for Europe. Lane. s eng. - M.: Kolos, 1996 - 912 p.
 5. Vasyutin, A.S. Testing of soil collectors in the foci of potato globoders / A.S. Vasyutin // Protection and quarantine of plants. -2003.-No 8.-P.32.
 6. Varshalovych, A.A. Quarantine and other types of beetles-pests of industrial raw materials and food stocks / A.A. Varshalovych. - M.: Kolos, 1975.- 275p.
 6. Varshalovich, A.A. Kaprovyy zhuk - dangerous quarantine pest zapov / A.A. Varshalovych. - M.: Kolos, 1963. – 112p.
 7. Identification of the capra beetle in warehouses / Y.B. Mordkovich, E.A. Sokolov // Protection and quarantine of plants. -2000.-No 12.-P.26.
 8. Dulova, E.V. Quarantine miners / E.V. Dulova // Protection and quarantine of plants. -2005.-No 5.- P.34.
 9. Drugova, E.V. Features of phytosanitary control over pests of greenhouse crops / E.V. Drugova, V.A. Nesterov // Protection and quarantine of plants. -2004.-No 2.-P.44.
 10. Zapolovsky, S.A. Ambrosia sagebrush in Zhytomyr region / S.A. Zapolovsky, A.A. Derega // Plant protection and quarantine. -2004.-No 11.-P.38.
 11. Zagulyaev, A.K. Moly and ognivki - pests of grain and food reserves / A.K. Zagulyaev. - M.-L.: Nauka, 1965.-167p.
 12. Zakladnoy, G.A., Ratanova V.F. Pests of bread stocks and measures to fight with them / G.A., Zakladnoy, Ratanova V.F. - M.: Kolos, 1973.- 250p.
 13. Protection of plants from diseases / V.A. Shkalikov, O.O. Beloshapkina, D.D. Bukreev et al. - M.: Kolos, 2001.-248 p.
 14. Protection of greenhouse and greenhouse plants from pests. Handbook / Ed. by S. S. Izhevskogo i A. K. Akhatov. — M., 1999. — 399 p.
 14. Ivapnova, N.A. Quarantine diseases of grapes // Protection and quarantine of plants. -2009.-No 2.-P.40.
 15. Izhevskiy, S. S. Introduction and application of entomophages / S.S. Izhevskiy. — M.: Agropromizdat, 1990. - 223 p.
 16. Isaichev, V.V.. Plant protection / V.V. Isaichev, I.V. Gorbachev et al. - M.: Kolos. -2002.- 17.
 17. Quarantine and phytosanitary state of the CIS member states and the Baltic states on 01.01.2000 - M.: 2000. - 267 p.
 18. Karachaeva E.I. Black pine barbel // Protection and quarantine of plants. -2011.-No 8.- P.37.
 19. Kvashnina, N.A. Monitoring of foci of bacterial burns of fruit crops in the south of Russia // Protection and quarantine of plants. -2010.-No 6.-P.40.
 20. Kuleshova, Yu.G. Virus sharks plums on the territory of the Russian Federation // Protection and quarantine of plants. -2010.-No 10.- P.35.
 21. Kulinich, O.A. Sosnovaya stem nematode // Protection and quarantine of plants. - 2010.- No 7.-P.36.
 22. Mordkovich, Y.B. Problems are common, and they must be solved together /// Protection and plant quarantine. -2010.-No 4.-P.34.

4.2. Additional Recommendations

(additional recommendations are given, such as: the possibility of using software products in preparation for the state exam, the use of computer technology, printed materials in the exam, etc.)

5. Assessment tools designed to establish during the attestation tests the compliance / non-compliance with the level of training of graduates who have completed the mastery of the OP HE in the direction of training / specialty, the requirements of the corresponding ES HE RUDN / FSES HE.
- The list of competencies that students must master as a result of mastering the educational program:**
- OK-1 is the ability to use the basics of philosophical knowledge to form a worldview position;

OK-2 ability to analyze the main stages and patterns of historical development of society for the formation of civil position;

OK-3 is the ability to use the basics of economic knowledge in various fields of activity;

OK-4 ability to communicate orally and in writing in Russian and foreign languages to solve the problems of interpersonal and intercultural interaction;

OK-5 ability to communicate orally and in writing in Russian and foreign languages to solve the problems of interpersonal and intercultural interaction;

OK-6 ability to work in a team, tolerantly perceiving social and cultural differences;

OK-7 ability to self-organization and self-education;

OK-8 ability to use methods and means of physical culture to ensure full social and professional activity;

OK-9 ability to use first aid techniques, methods of protection in emergency situations;

OK-10: owns interrelated types of productive and reproductive foreign speech activity, including writing, speaking, reading, listening, translating;

OK-11 has foreign language communicative competence in official-business, educational-professional, scientific, socio-cultural, everyday-everyday spheres of foreign communication;

OK-12 is able to use a foreign language in the process of professional activity in the direction of training (specialty);

OK-13 effectively and fully solve professional and scientific-professional tasks, realize professional and business, scientific- professional, general cultural communicative needs by means of the Russian language;

OK-14 to establish and maintain tolerant professional and communicative relations with Russian business partners based on respect for the cultural, social, socio-political realities and values of Russian society, on knowledge of the norms and rules of effective interaction adopted in the Russian professional and business communities;

OK-15 to conduct research activities in Russian language, to take part in the work of Russian scientific communities (including in the Internet environment);

OK-16 to conduct and formalize design, scientific and qualification work in Russian language;

OK-17: to carry out continuous professional and communicative self-development and self-improvement in the field of Russian-language scientific-professional and professional-business communication;

OPK-1: the ability to search, store, process and analyze information from various sources and databases, to present it in the required format using information, computer and network technologies;

OPK-2: the ability to use knowledge about land resources to organize their rational use and determine measures to reduce anthropogenic impact on the territory;

OPK-3: the ability to use the knowledge of modern technologies of design, cadastral and other works related to land management and cadastres;

OPK-4: Ability to find organizational and managerial solutions in professional activities and readiness to take responsibility for them;

OPK-5: The ability to search, store, process and analyze information from various sources and databases, to present it in the required format using information, computer and network technologies;

OPK-6: The ability to use knowledge about land resources to organize their rational use and identify measures to reduce anthropogenic impact on the territory;

OPK-7: Ability to use knowledge of modern technologies of design, cadastral and other works related to land management and cadastres;

OPK-8: Ability to use knowledge of modern technologies of design, geodetic, photogrammetric, cartographic, cadastral and other works related to land management and cadastres;

OPK-3 ability to use knowledge of modern technologies of design, cadastral and other works related to land management and cadastres;

PP-1: the ability to apply knowledge of the laws of the country for the legal regulation of land and property relations, control over the use of land and real estate;

PP-2: Ability to use knowledge for land administration, real estate, organization and conduct of cadastral and land management works PP-5: the ability to conduct and analyze the results of research in land administration and cadastres;

PP-10: the ability to use knowledge of modern technologies for collecting, systematizing, processing and accounting information about real estate objects of modern geographical and land information systems (hereinafter referred to as GIS and ZIS);

PP-11: the ability to use knowledge of the principles, indicators and methods of cadastral and economic valuation of land and other real estate objects PP-12: the ability to use knowledge of modern technologies in land management and cadastral work;

PP-13: the ability to use knowledge of modern methods and technologies for monitoring land and real estate;

PC-14: the ability to use knowledge of modern technologies of technical inventory of capital construction projects;

PC-15 with the ability to use computer-aided design tools in carrying out, land management, cadastral and geodetic works;

PC-16 has the ability to use the knowledge of modern satellite GLONASS / GPS technologies to provide land management and cadastral work with geospatial data.

(in accordance with the current regulatory framework)

Compliance of grading systems (previously used grades of final academic performance, ECTS grades and the point-rating system (PRS) of assessments of current academic performance).

BRS Scores	Traditional Assessments of the Russian Federation	Evaluation ECTS
95 - 100	5	A
86 - 94		B
69 - 85	4	C
61 - 68	3	D
51 - 60		E

31 - 50	2	FX
0 - 30		F
51-100	Credit	Passed

Explanation of the rating table:

Description of ECTS ratings

A	"Excellent" - the theoretical content of the course is mastered completely, without gaps, the necessary practical skills of working with the mastered material are formed, all the educational tasks provided for by the training program are completed, the quality of their implementation is estimated by the number of points close to the maximum.
B	"Very good" - the theoretical content of the course is mastered completely, without gaps, the necessary practical skills of working with the mastered material are mainly formed, all the educational tasks provided for by the training program are completed, the quality of most of them is estimated by the number of points close to the maximum.
C	"Good" - the theoretical content of the course is 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 none of them is assessed by a minimum number of points, some types of tasks are performed with errors.
D	"Satisfactory" - the theoretical content of the course is partially mastered, but the gaps are not significant, the necessary practical skills of working with the mastered material are mainly formed, most of the educational tasks provided for by the training program have been completed, some of the completed tasks may contain errors.
E	"Mediocre" - the theoretical content of the course is partially mastered, some practical skills are not formed, many of the training tasks provided for by the training program have not been completed, or the quality of some of them is estimated 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 of work 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 is estimated by a number of points close to the minimum; with additional independent work on the course material, it is possible to improve the quality of the performance of educational tasks.
F	"Certainly unsatisfactory" - the theoretical content of the course has not been mastered, the necessary practical skills of work have not been formed, all completed educational tasks contain gross errors, additional independent work on the course material will not lead to any significant improvement in the quality of the performance of educational tasks.

Positive grades, in which the course is counted as completed by the student, are grades A, B, C, D and E.

A student who has received an **FX** grade in the discipline of the educational program is obliged, after consultation with the appropriate teacher, to successfully complete the required minimum amount of training work provided for in the training program within the time limits established by the training part and submit the results of these works to this teacher. If the quality of the work is found to be satisfactory, the final FX score is increased to E and the trainee is allowed for further training.

In the event that the quality of the training work remains unsatisfactory, the final grade is reduced to F and the trainee is submitted for expulsion. In case of receiving a score of F and FX, the trainee is submitted for deduction regardless of whether he has any other debts in other disciplines. Order of the Rector of RUDN University No. 996 of 27.12.2006)

Rating scale for the test part

Number of correct answers, %	Traditional Assessments of the Russian Federation	Evaluation ECTS
95 - 100	5	A
86 - 94		B
69 - 85	4	C
61 - 68	3	D
51 - 60		E
31 - 50	2	FX
0 - 30		F
51-100	Credit	Passed

Grade scale for oral response in an interdisciplinary examination: A score

of "5" (excellent) is given if:

- the content of the material of the examination card is fully disclosed;
- the material is presented competently, in a certain logical sequence;
- systematic and in-depth knowledge of the program material is demonstrated;
- terminology is used accurately;
- shows the ability to illustrate theoretical positions with concrete examples , to apply them in a new situation;
- demonstrated assimilation of previously studied related issues, formation and stability of competencies, skills and abilities;
- the answer sounded independently, without leading questions;
- demonstrated the ability to creatively apply knowledge of theory to the solution of professional problems;
- knowledge of modern educational and scientific literature is demonstrated;
- there are one ~ two inaccuracies in the coverage of minor issues, which are corrected by the remark.

A score of "4" (good) is given if:

- the issues of the examination material are presented systematically and consistently;
- the ability to analyze the material has been demonstrated, but not all conclusions are reasoned and evidentiary;
- the assimilation of the main literature is demonstrated.
- the answer satisfies mainly the requirements for a score of "5", but it has one of the disadvantages:
- there are small gaps in the presentation that do not distort the content of the answer; there were one or two shortcomings in the coverage of the main content of the answer, corrected at the conclusion of the examiner;
- there is an error or more than two shortcomings in the coverage of secondary issues, which are easily corrected by the examiner's remark.

A score of "3" (satisfactory) is given if:

- the content of the material is incomplete or inconsistently disclosed, but a general understanding of the issue is shown and skills sufficient for further assimilation of the material are demonstrated;
- the main categories on the issues under consideration and additional issues have been mastered;
- there were difficulties or mistakes in the definition of concepts, the use of terminology, corrected after several leading questions;
- with incomplete knowledge of the theoretical material, insufficient formation of competencies, skills and abilities is revealed, the student cannot apply the theory in a new situation;
- the assimilation of the main literature is demonstrated.

A score of "2" (unsatisfactory) is given if:

- the main content of the educational material is not disclosed;
- ignorance or misunderstanding of the largest or most important part of the educational material is detected;
- mistakes were made in the definition of concepts, when using terminology, which are not corrected after several leading questions.
- competencies, skills and abilities are not formed.

Evaluation of the result of the defense of the final qualification work is carried out at a closed meeting of the SEC. The following criteria are taken as a basis:

- relevance of the topic;
- scientific and practical significance of the topic;
- quality of work;
- the content of the report and the answers to the questions;
- visibility of the presented research results in the form of slides.

The generalized assessment of the defense of the final qualification work is determined taking into account the feedback of the supervisor and the assessment of the reviewer.

The results of the defense of the final qualification work are evaluated according to a four-point system:

- the **"excellent"** rating is assigned for a deep disclosure of the topic, high-quality design of the work, the content of the report and presentation;
- the **"good"** grade is assigned if the above criteria are met, but if there are small shortcomings or shortcomings in the presentation of the results for defense in the content of the work and its design;
- a **rating of "satisfactory"** is assigned for incomplete disclosure of the topic, conclusions and proposals of a general nature, lack of visual representation of the work and difficulties in answering questions;
- the rating **"unsatisfactory"** is assigned for weak and incomplete disclosure of the topic, lack of independence of presentation of the material, conclusions and proposals of a general nature, lack of visual representation of the work and answers to questions.

Criteria for evaluating final qualification works:

- 1) Relevance of the study, the focus of the technology under consideration on solving urgent problems of the land and property complex;
- 2) Compliance of the database of sources, content and conclusions with the topic, goals and objectives of the WRC, sufficiency and modernity of the used bibliographic material and other sources;
- 3) Quality of performance of tasks:
 - the presence in the work of all structural elements of the study;
 - the use of effective design methods;
 - the presence of a reasonable author's position that reveals the vision of the essence of the problem by the researcher and the choice of methods for its solution;
 - the use in the experimental part of the study of a reasonable set of methods and techniques that allow solving the tasks;
 - the integrity of the study, which is manifested in the coherence of its theoretical and project parts.
- 4) The degree of independence of the student in the implementation of the WRC;
- 5) Scientific and practical value of the conclusions made, the prospects of the study: the presence in the work of material that can become a source of further research;
- 6) Compliance of WRC registration with the established requirements;
- 7) Student's speeches at scientific conferences on WRC materials, scientific publications;
- 8) Implementation of the student's research results presented in
- 9) WRC (presence of the act of implementation);
- 10) WRC Protection:
 - quality of the report: composition, completeness of the presentation of the work, its results, reasoning, persuasiveness;
 - the volume and depth of knowledge on the topic, erudition, the use of interdisciplinary links;
 - pedagogical orientation: culture of speech, manner of presentation, sense of time, control over the attention of the audience;

- quality of answers to questions: completeness, reasoning, use of strengths of work in answers;
- business and strong-willed qualities of the speaker: responsibility, desire to achieve high results, readiness for discussion;
- availability and quality of presentation/handouts.

The most theoretically and practically interesting final qualification works can be recommended for participation in the competition of final qualification works. Authors of such works can be recommended for admission to the magistracy.

6. Requirements for the final qualification work

6.1. A student who has passed the state exam (*if any*) is allowed to defend the WRC. The defense of the WRC is carried out at an open meeting of the State Examination Commission (SEC).

The state final certification is carried out in the form of an oral submission to the WRC, followed by oral answers to the questions of the members of the SEC in accordance with the University Regulations on the WRC. The report and/or answers to the questions of the members of the SEC may be in a foreign language.

6.2. As part of the defense of the master's thesis, the degree of mastery of graduates of the following competencies is checked:

- the ability to conduct scientific research and obtain new scientific and applied results independently and as part of a scientific team
- the ability to use in-depth theoretical and practical knowledge in the field of information technology and applied mathematics, fundamental concepts and system methodologies, international and professional standards in the field of information technology
- the ability to develop conceptual and theoretical models of solvable scientific problems and tasks of design and production-technological activity
- the ability to develop architectural and functional specifications of the created systems and tools, as well as to develop abstract methods for testing them
- ability to manage projects, plan research activities, analyze risks, manage the project team
- ability to in-depth analysis of problems, formulation and substantiation of tasks of scientific and design-technological activity
- ability to develop and optimize business plans for scientific and applied projects
- ability to organize corporate learning processes based on electronic and mobile technologies and develop corporate knowledge bases
- the ability to realize and develop corporate standards and policies for the development of corporate information technology infrastructure on the principles of open systems

6.3. List of topics of the master's thesis:

1. Evaluation of the new source material of spring soft wheat with effective genes for resistance to race Ug99 stem rust by a complex of economically valuable features in the conditions of the Moscow region.
2. Assessing the Genetic Diversity of a Soybean Collection Using Molecular Markers
3. Analysis of the resistance of new tomato hybrids to the tobacco mosaic virus
4. Evaluation of the effect of growth stimulants on carrot seeds
5. Design of vector constructs for localization of heterologous desaturase in various plant cell compartments
6. Development of rapid immunochromatographic tests for extra-laboratory control of ecotoxicants
7. Study of tomato varieties and hybrids for industrial processing

8. Development of an immunoassay enhancement system for highly sensitive detection of phytopathogens
9. Comparative characteristics of toxins of different strains of fungi p. Sclerotinia
10. Study of the features of the pathogenesis of bacterial cancer on roses in the Ulyanovsk PU and the development of a system of effective protective measures
11. Monitoring of the main pests of flower crops in the conditions of protected ground of the Ulyanovsk PU and improvement of the system of protective measures
12. The use of drugs based on entomopathogenic nematodes to improve the system of biological control of pests in protected ground
13. Influence of integrated cucumber protection elements in closed ground conditions

6.4. Tasks that the student must solve in the process of performing the master's thesis

1. Prepare a literature review in the relevant topic of the selected research
2. Formulate the goals and objectives of the experiment, master the methodology corresponding to the research profile
3. Summarize the materials of experimental studies and conduct statistical analysis and determine the reliability of the results obtained
4. Formulate conclusions and compare the results obtained with the existing developments in this area
5. On the topic of the studies carried out to prepare a report and submit it to the attestation commission.
6. Protect the provisions to be defended.

6.5. Stages of completion of the final qualification work (WRC), conditions

Admission of the student to the protection procedure, requirements for the structure, volume, content and design, as well as a list of mandatory and recommended documents submitted for protection are indicated in the guidelines approved in accordance with the established procedure:

The stages of the final qualification work (WRC) include:

1. Formulation of the problem and its validity
2. Literature review
3. Collection, analysis and systematization of data and information
4. Conducting a study
5. General conclusion on the work
6. Report and presentation
7. Answers to questions

A month before the planned date of defense, it is necessary to submit an intertwined version of the master's thesis, signed by the author with the feedback of the supervisor and an outside scientist.

The master's program should include an introduction to the literature review, the goals and objectives of the study of the experimental part, conclusions and conclusion, a list of references.

The recommended volume of the Master's thesis is 70 pages of text with a font size of 14 kegels and a line spacing of 1.5 in hardcover.

6.6 Valuation Tools.

The assessment consists of certain components:

List of evaluation criteria and material to be tested

Raz-del	Assessed components of the WRC	Max score	Criteria	Material

1.	Formulation of the problem and its validity	10	<ul style="list-style-type: none"> ▪ Relevance of the topic of work and scientific problem of research ▪ Theoretical and/or practical significance of the study ▪ Correctness of setting goals and objectives of the study, their compliance with the stated topic 	<ul style="list-style-type: none"> ▪ Report ▪ Sections of the text of the work containing a substitution and description of the task (introduction, literature review, theoretical part, etc.) ▪ Feedback from the supervisor and reviewer ▪ Answers to questions
2.	Literature review	10	<ul style="list-style-type: none"> ▪ scientific-theoretical level, completeness and depth of theoretical research ▪ number of sources used, including in foreign languages ▪ relevance of the sources used ▪ the quality of critical analysis of publications, their relevance to the problem under consideration 	<ul style="list-style-type: none"> ▪ Report ▪ Sections of the text of the work containing a description of the problem, the statement of the problem, the place of research in the current literature on the topic (introduction, literature review, theoretical part) ▪ Feedback from the supervisor and reviewer ▪ Answers to questions
3.	Collection, analysis and systematization of data and information	15	<ul style="list-style-type: none"> ▪ independence and quality of the results of information and analytical work (collection, analysis and systematization of data / information); ▪ reliability of the sources of information used; completeness of the data provided for solving the tasks (coverage of the external and internal environment); 	<ul style="list-style-type: none"> ▪ Report ▪ Sections of the text of the work containing a description of the data and information used for the study, and the justification of the methods and solutions used to collect and analyze data and information (literature review, theoretical part, practical part, methodological part) ▪ Feedback from the supervisor and reviewer ▪ Answers to questions
4.	Carrying out investigations	20	<ul style="list-style-type: none"> ▪ independence and quality of empirical research; ▪ independence of choice and validity of the application of models / methods of quantitative and qualitative analysis, correctness of the use of methods of analysis, evaluation / calculations in the course of empirical research 	<ul style="list-style-type: none"> ▪ Report ▪ Sections of the text of the work containing a description of the practical part of the study, conclusions and comments (introduction, practical part, conclusion) ▪ Reviewers' feedback ▪ Testimonial of the supervisor ▪ Answers to questions
5.	General conclusion on the work	15	<ul style="list-style-type: none"> • reliability, novelty and practical significance of the results; 	<ul style="list-style-type: none"> • Report • Sections of the text of the work containing conclusions and

			<ul style="list-style-type: none"> • independence, validity and consistency of conclusions; • completeness of the solution of the tasks; • independence and depth of research as a whole; • literacy and consistency of written presentation. 	comments (introduction, practical part, conclusion) <ul style="list-style-type: none"> • Feedback from the supervisor and reviewer • Answers to questions
6.	Report and presentation	20	<ul style="list-style-type: none"> • Clarity, consistency, professionalism of the presentation of the report; • visibility and structuring of the presentation material; the ability to correctly use professional vocabulary and conceptual and categorical apparatus. 	<ul style="list-style-type: none"> • Report • Testimonial of the supervisor • Answers to questions
7.	Answers to questions	10	<ul style="list-style-type: none"> • the degree of mastery of the topic; • clarity and scientific reasoning of the author's views; • Clarity of answers to questions. 	<ul style="list-style-type: none"> • Answers to reviewers' comments ■ Answers to questions from members of the commission

The program is drawn up in accordance with the requirements of the ES HE RUDN/FSES HE.

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