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**Federal State Autonomous Educational Institution of Higher Education  
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA NAMED AFTER PATRICE  
LUMUMBA**

**RUDN University**

**ACADEMY OF ENGINEERING**

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educational division (faculty/institute/academy) as higher education program developer

**FINAL STATE EXAMINATION SYLLABUS**

**Recommended by the Didactic Council for the Education Field of:**

**27.04.05 Innovatics**

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field of studies / speciality code and title

**The final state examination is implemented within the professional education program  
of higher education:**

**Digital Transformation in Production Management**

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higher education program profile / specialisation title

**2025 year**

## 1. FINAL STATE EXAMINATION GOAL AND TASKS

**The goal** of the FSC within the framework of the implementation of the EP HE «Digital Transformation in Production Management» is to determine the compliance of the results of mastering the EP HE by students with the relevant requirements of the Federal State Educational Standard of HE.

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

- checking the quality of teaching a person basic humanitarian knowledge, natural science laws and phenomena necessary in professional activities;
- determination of the level of theoretical and practical preparedness graduate to perform professional tasks in accordance with the received qualification;
- establishing the degree of a person's desire for self-development, improving their qualifications and skills;
- checking the formation of a graduate's sustainable motivation for professional activities in accordance with the stipulated ES HE types of tasks of professional activity;
- assessment of the level of graduates' ability to find organizational and managerial decisions in non-standard situations and readiness to bear for them responsibility;
- 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 of specialists in accordance with the FSES HE requirements

## 2. REQUIREMENTS FOR HIGHER EDUCATION PROGRAMME COMPLETION AND LEARNING OUTCOMES

A student who does not have failed tests or exams and who has fully completed the curriculum or the individual curriculum of the higher education programme is allowed to the final state examination. On the higher education programme completion the graduate is expected to master the following

**generic competences (GC):**

Code and descriptor of the competences
GC-1 Able to carry out a critical analysis of problem situations on the basis of a systematic approach, to develop an action strategy
GC-2 Able to manage the project at all stages of its life cycle
GC-3 Able to organize and lead the work of the team, developing a team strategy to achieve the goal
GC-4 Able to apply modern communication technologies, including in a foreign language(s), for academic and professional interaction
GC-5 Able to analyze and take into account the diversity of cultures in the process of intercultural interaction
GC-6 Able to determine and implement the priorities of their own activities and ways to improve them on the basis of self-esteem
GC-7. Able search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the information received to solve problems; evaluate information, its reliability, build logical conclusions based on incoming information and data

**general professional competences (GPC):**

Code and descriptor of the competence
GPC-1 Able to analyze and identify the natural science essence of control problems in technical systems on the basis of provisions, laws and methods in the field of mathematics, natural and technical sciences
GPC-2 Able to formulate management problems in technical systems and justify methods for solving them

GPC-3	Able to independently solve control problems in technical systems based on the latest achievements of science and technology
GPC-4	Able to develop criteria for evaluating management systems in the field of innovation based on modern mathematical methods, to develop and implement management decisions to improve their efficiency
GPC-5	Able to conduct patent research, determine the forms and methods of legal protection and protection of rights to the result of intellectual activity, dispose of the rights to them to solve problems in the field of development of science, technology and technology
GPC-6	Able to collect and analyze scientific and technical information, summarize domestic and foreign experience in the field of innovation management and building innovation ecosystems
GPC-7	Able to reasonably select and justify structural, algorithmic, technological and software solutions for managing innovation processes and projects, implement them in practice in relation to the innovation systems of the enterprise, industry and regional innovation systems
GPC-8	Able to perform experiments at existing facilities according to specified methods and process the results using modern information technologies and technical
GPC-9	Able to solve professional problems based on the history and philosophy of innovations, mathematical methods and models for innovation management, knowledge of the features of the emerging technological structures and the fourth industrial revolution in the innovation sphere
GPC-10	Able to develop, combine and adapt algorithms and software applications suitable for solving practical problems of digitalization in the field of professional activity
GPC-11	Able to develop, combine and adapt algorithms and software applications suitable for solving practical problems of digitalization in the field of professional activity

#### **professional competences (GPC):**

<b>Code and descriptor of professional competence</b>	
PC-1	The ability to organize the work of the creative team to achieve the scientific goal, to find and make management decisions, to evaluate the quality and effectiveness of labor, costs and results of the research and production team
PC-2	The ability to find (choose) the best solutions when creating new high-tech products, taking into account the requirements of quality, cost, deadlines, competitiveness and environmental safety
PC-3	Ability to develop a plan and program for the organization of innovative activities of the research and production unit, to carry out a feasibility study of innovative projects and programs

### **3. FINAL STATE EXAMINATION PROCEDURE**

The final state examination can be conducted both in in-person format (students and the state examination committee are at RUDN University during the examination), and through the use of distance learning technologies (DLT) available in the RUDN Electronic Information and Educational Environment.

The procedure for in-person or DLT-facilitated final state examination is regulated by the relevant local normative act of the RUDN University.

The final state examination within the framework of the higher education programme includes:

- state exam;
- defense of the graduation qualifying paper (degree thesis).

### **4. STATE EXAM PROCEDURE**

The total workload of the State Exam is 3 credits.

The state exam is held in one or more disciplines and (modules) of the higher education programme, whose mastery bears a decisive importance for graduates' occupational performance.

The state exam is held in two stages:

**The first stage** includes the assessment of the level of a graduate's theoretical training in the form of **computer testing** through the tools available in the RUDN Electronic Information and Educational Environment (EIEE).

**The second stage** focuses on the assessment of the graduate's practical preparation for future occupational activities in the form of **solving work-related situational problems (cases)**.

In order to prepare students for taking the state exam, the head of the educational programme (no later than one calendar month before the start of the final state examination) shall familiarize the graduate students with the final state examination syllabus, the comprehensive list of theoretical issues included in the state exam, examples of work-related (occupational) situational tasks (cases) that the students will have to solve in the process of taking the state exam, as well as with the procedure for each stage of the state exam and the grading system for evaluating its results (with assessment materials).

Before the state exam, students are offered consultations on issues and tasks included in the state exam (mandatory pre-exam consultation).

**The procedure for conducting the computer testing** within the final state examination is as follows. The test task contains 40 questions. The student is given 90 minutes to complete the test task. The maximum number of points that can be obtained for computer testing is 40 points (1 point for the correct answer to one question).

**The procedure for conducting the second stage of the state exam** is as follows.

The second stage of the State Examination is carried out in written form using exam papers. Each exam card contains three questions of an interdisciplinary nature, aimed at determining the level of theoretical and practical preparedness of the graduate to solve professional problems determined by the RUDN OS HE / Federal State Educational Standards of Higher Education in accordance with the type of professional activity on which the educational program is oriented.

The total number of exam tickets is determined by the number of students admitted to take the state exam. The student is given 180 minutes to prepare a written response to the ticket. The maximum number of points that can be obtained for the written exam is 60 points (20, 20 and 20 points respectively).

The state exam results evaluation is carried out in accordance with the methodology set forth in the assessment toolkit that is specified in the Appendix to this syllabus.

## **5. REQUIREMENTS FOR GRADUATION QUALIFYING PAPER (DEGREE THESIS) AND PROCEDURE FOR ITS DEFENCE**

The degree thesis is a graduation qualifying paper that the student (several students in a team) prepare to demonstrate his/her/their level of competence and work readiness.

The list of degree theses themes offered to students for further work is approved by the order of the head of the educational division that runs the higher education programme, the respective information is delivered to the students by the programme head no later than six months before the date of the final state examination start.

The students are allowed to suggest their own themes for the theses, under the set procedure.

The student who has passed the state exam is admitted to defend the graduation degree thesis.

The student (students) is/are allowed to defend his/her/their thesis only if this fully completed degree paper is signed by the respective graduate (s), the supervisor, the consultant (if any), the heads of the educational department and educational division; the thesis is also subject to the external review procedure (mandatory for master's and specialist's programmes) and the plagiarism check (in the "Anti plagiarism" system). The review of the graduation qualifying paper supervisor shall be attached as well, with a specific emphasis laid on the graduate's activities in the course of the degree thesis drafting.

No later than 14 days before the date of the thesis defense, a rehearsal of the procedure is held at the presence of the degree thesis supervisor and other academic staff of the educational department, in order to timely identify and eliminate shortcomings in the structure, content and design of the degree thesis.

The degree theses are introduced to the State Examination Board members at the public defense procedure. It includes the students' oral reports with mandatory multimedia (graphic) presentations that introduce the thesis main content.

At the end of the reports, the students reply orally to the State Examination Board members' questions regarding the subject, structure, content of the paper and the profile/ specialization of the higher education programme. The reports and/or answers to the Board members' questions may be delivered in a foreign language.

The stages of the graduation qualifying paper preparation, the requirements for its structure, volume, contents and design, as well as the list of mandatory and recommended documents submitted for defense are specified in the relevant guidelines.

The evaluation of the degree thesis defense results is carried out in accordance with the methodology set forth in the assessment toolkit that is specified in the Appendix to the syllabus.

## **6. REQUIREMENTS FOR EQUIPMENT AND TECHNOLOGY SUPPORT FOR FINAL STAE EXAMINATION**

To prepare for the State Examination and for the Higher Qualification Test, students use classrooms equipped with specialized furniture, computer equipment, hardware, software with a suite of office applications, and Internet access.

To conduct the first stage of the State Exam (computer testing), a classroom equipped with workstations with personal computers equipped with the necessary software and an Internet connection.

To conduct the second stage of the State Examination (answering exam papers) and defending the examination papers, a classroom equipped with:

- equipment for public presentations of the results of the research and development work, including a multimedia screen, projector, and audio equipment;
- a board for illustrating answers to questions.

The student can inform the head of the department in writing about wishes for additional material and technical equipment (if necessary) of the audience assigned to defend the thesis no later than a week before the defense procedure.

## **7. RESOURCES RECOMMENDED FOR FINAL STATE EXAMINATION**

*Main readings to prepare for the state exam and/or degree thesis defense:*

1. The procedure for organizing and carrying out educational activities in educational programs of higher education – bachelor's, specialist and master's programs implemented in the federal state autonomous educational institution of higher education "Peoples' Friendship University of Russia", approved by the Rector's Order No. 354 dated 06/02/2022.

2. The procedure for conducting the final certification of students in the main professional educational programs of higher education - bachelor's programs, specialty programs and master's programs implemented in the federal state autonomous educational institution of higher education "Peoples' Friendship University of Russia", approved by the Rector's Order No. 10 dated January 19, 2023.

3. Regulations for the use of the Anti-Plagiarism system for checking written academic work at RUDN, approved by the Rector's Order No. 228 dated March 30, 2018.

4. Basic literature and additional literature indicated in the work programs of the disciplines of the educational program (in preparation for the state exam).

*Additional readings to prepare for the state exam and/or degree thesis defense:*

5. Federal Law "On Education in the Russian Federation" dated December 29, 2012 No. 273-FZ.

6. The procedure for organizing and carrying out educational activities in educational programs of higher education – bachelor's programs, specialty programs, master's programs, approved by Order of the Ministry of Education and Science of Russia dated April 5, 2017 No. 301.

7. The procedure for conducting state final certification for educational programs of higher education – bachelor's programs, specialty programs and master's programs, approved by Order of the Ministry of Education and Science of Russia dated June 29, 2015 No. 636.

### *Internet sources*

1. Electronic libraries (EL) of RUDN University and other institutions, to which university students have access on the basis of concluded agreements:

- RUDN Electronic Library System (RUDN ELS) <http://lib.rudn.ru/MegaPro/Web>
- EL "University Library Online" <http://www.biblioclub.ru>
- EL "Yurayt" <http://www.biblio-online.ru>
- EL "Student Consultant" [www.studentlibrary.ru](http://www.studentlibrary.ru)
- EL "Lan" <http://e.lanbook.com/>
- EL "Trinity Bridge"

2. Databases and search engines:

- electronic foundation of legal and normative-technical documentation <http://docs.cntd.ru/>
- Yandex search engine [https:// www .yandex.ru/](https://www.yandex.ru/)
- Google search engine <https://www.google.ru/>
- Scopus abstract database <http://www.elsevierscience.ru/products/scopus/>

*The training toolkit and guidelines for student's self-studies to prepare for the state exam and/or to draft the degree thesis and defend it\*:*

1. The guidelines for drafting and formatting the degree thesis within the EP HE «Digital Transformation in Production Management».

2. The procedure for the degree thesis check in the "Anti-plagiarism" system.

3. The procedure for conducting the final state examination under the EP HE «Digital Transformation in Production Management» through the use of DLT and proctoring system.

\* The training toolkit and guidelines for the student's self-studies are placed on the final state examination page in the university telecommunication training and information system under the set procedure.

## **8. ASSESSMENT TOOLKIT AND GRADING SYSTEM FOR EVALUATION OF GRADUATES' COMPETENCES LEVEL**

The assessment materials and the grading system to evaluate the graduate's level of competences (competences in part) formation as the results of the higher education programme completion are specified in the Appendix to this syllabus.

**HEAD OF EDUCATIONAL DEPARTMENT:**

**Department of Innovation Management in Industries**  
educational department

**O.E. Samusenko**  
name and surname

**HEAD OF HIGHER EDUCATION PROGRAMME:**

**Associate professor, Department of Innovation Management in Industries**  
position, department

**E.A. Kovaleva**  
name and surname