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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**

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

FINAL STATE EXAMINATION SYLLABUS

Recommended by the Didactic Council for the Education Field of:

21.04.01 Oil and gas engineering

field of studies / speciality code and title

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

Oil and gas engineering / Технологии добычи и транспортировки нефти и газа

higher education programme profile/specialisation title

1. FINAL STATE EXAMINATION GOAL AND TASKS

The goal of the final state examination within the framework of the higher education programme implementation is to check the conformity of the students' training outcomes as the programme results with the relevant requirements of the Federal State Educational Standard of the Higher Education or the RUDN University Educational Standards.

The tasks of the final state examination include the following:

- checking the quality of teaching a person basic humanitarian knowledge, natural science laws and phenomena necessary for professional activities of a graduate;
- identifying the level of theoretical and practical readiness of a graduate to perform professional tasks in compliance with the qualification obtained;
- establishing the degree of a person's desire for self-development, improving his or her qualifications and skills;
- exploring the formation of a graduate's sustainable motivation for professional activities in compliance with the types of tasks of professional activities provided for by the Federal State Educational Standard of the Higher Education or the RUDN University Educational Standards;
- assessing the level of graduates' ability to find organizational and managerial solutions in non-standard situations and evaluating graduates' readiness to bear responsibility for them;
- ensuring the integration of education and scientific and technical activities, increasing the efficiency of scientific and technological achievements use, reforming the scientific sphere and stimulating innovation;
- ensuring the quality of specialists' training in compliance with the requirements of the Federal State Educational Standards of the Higher Education or the RUDN University Educational Standards.

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 **general competences (GC)**:

Code and descriptor of the generic competences
GC-1. Able to search, make a critical analysis of problem situations based on a systematic approach, develop a strategy.
GC-2. Able to manage a project at all stages of its life cycle.
GC-3. Able to organize and manage team work, develop a team strategy to achieve the goal.
GC-4. Able to carry out business communication in oral and written forms in the state and foreign(s) language(s)
GC-5. Able to analyze and take into account the diversity of cultures in the process of intercultural interaction.
GC-6. Able to identify and implement the priorities of their own activities and ways to improve them based on self-assessment.
GC-7. Able to: search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as algorithms when working with data received 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

Code and descriptor of the generic competences
data.

- general professional competencies (GPC):

Code and descriptor of the GPC
GPC-1. Able to solve production and/or research tasks based on fundamental knowledge in the oil and gas field.
GPC-2. Able to design oil and gas production facilities
GPC-3. Able to develop scientific and technical, design and service documentation, draw up scientific and technical reports, surveys, publications, reviews
GPC-4. Able to find and process the information required for decision-making in scientific research and in practical technical activities
GPC-5. Able to evaluate the results of scientific and technical developments, scientific research and justify their own choice, systematizing and summarizing achievements in the oil and gas industry and related fields
GPC-6. Able to participate in the implementation of basic and additional professional educational programs, using special scientific and professional knowledge

- specialized professional competencies (SPC):

Code and descriptor of the SPC
SPC-1 Able to use theoretical knowledge when performing technological scientific research in the field of development, transportation and processing of oil and gas
SPC-2 Able to develop and implement new advanced technologies in the field of geological exploration, evaluation and estimation of hydrocarbon raw materials
SPC-3 Able to assess resources, estimate and re-estimate hydrocarbon reserves for scientific and technological projects planning
SPC-4 Able to manage the system for monitoring the technical condition and technical diagnostics at the facilities and plants of the oil and gas complex
SPC-5 Able to draw up technical documentation for the implementation of the technological process (work schedules, instructions, plans, estimates, requests for materials, equipment, etc.), make an economic assessment of oil and gas fields in accordance with approved forms
SPC-6 Able to apply the basic principles of rational use of natural resources and environmental protection
SPC-7 Able to organize, manage, and carry out quality control of the main types of work in the development of oil and gas fields, transportation and processing of oil and gas
SPC-8 Able to manage the work on the diagnostic examination of the main oil pipelines (MN) and main oil product pipelines (MNPP) facilities
SPC-9 Able to organize the work of executors, find and make management decisions, rules for ensuring the safety of technological processes, as well as personnel safety when working in the field, in laboratories, in office processing

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

- defence of the graduation qualifying paper (degree thesis).

4. STATE EXAM PROCEDURE

The volume of the SE for the HEP HE is 3 credit units.

The state exam is held in two stages:

First stage: assessment of the level of theoretical training of a graduate in the form of **computer testing** using the tools available in the RUDN Electronic Information and Educational Environment (EIEE);

Second stage: evaluation of the graduate's practical preparation for future professional activity in writing using examination papers.

In order to prepare students the SE, the supervisor of the HEP HE (no later than one calendar month before the start of the FSE) must familiarize graduate students with this SFC program, an exhaustive list of theoretical issues included in the SE, examples of production situational tasks (cases), which must be solved in the process of passing the certification test, as well as with the procedure for conducting each of the State Examination's stages and the methodology for evaluating its results (with assessment materials).

Before the SE, students are required to be consulted on issues and tasks included in the SE program (pre-examination consultation).

The procedure for conducting computer testing within the FSE is as follows:

The test task contains 50 questions. The student has 100 minutes to complete the test task.

Evaluation of computer testing is carried out on a 100-point scale. At the same time, the test part is considered successfully passed if the student scored 51 or more points based on the test results.

Successful passing by the student of the test part is an admission to the passage of the second stage of the SE.

The procedure for conducting the second stage of the SE is as follows:

Each examination paper contains three questions.

The questions included in the examination paper are interdisciplinary in nature and are aimed at determining the level of theoretical and practical readiness of a graduate to solve professional problems defined by the educational standard of RUDN University in accordance with the types of tasks of professional activity the educational program is focused on.

The total number of examination papers is determined by the number of students admitted to the state exam, but not less than 20. The student is given 90 minutes to prepare and defend the written answer to the tasks on the paper.

At the state exam, the SEC members may ask the student additional questions in the field of the graduate's professional activity, provided for by the educational standard.

The evaluation of the results of the SE is carried out in accordance with the methodology set forth in the evaluation materials provided in the Appendix to this SFC program.

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

The GQP is a work done by a student (several students together), demonstrating the level of preparation of a graduate for independent professional activity.

The list of topics for graduation qualification works proposed to students is approved by the order of the Head of the Engineering Academy who implements the HEP HE, and is brought to the attention of the graduate students by the program director no later than 6 months before the date of start of the GQP.

The preparation and defense of the thesis on a topic proposed by the student(s) is allowed in accordance with the established procedure.

A student who has passed the SE is allowed to defend the GQP.

Only a fully completed GQP, which has been signed by the graduate(s), who completed it, by the supervisor, the advisor (if any), the heads of the issuing educational department and educational division, and which has passed the external review procedure (mandatory for master's and specialist programs) and the check for the amount of borrowing (in the "Antiplagiat" system). It is mandatory to enclose to the GQP, admitted to the defense, a review of the supervisor on the work of the graduate during the preparation of the GQP.

In order to identify and timely eliminate shortcomings in the structure, content and design of the GQP, a rehearsal of the defense by students of their work (pre-defense) is held, no later than 14 days before the date of the defense, in the presence of the head of the GQP and other teachers of the graduating educational department.

The defense of the GQP is held at an open meeting of the State Examination Commission (SEC).

The certification test is carried out in the form of an oral report of students with a mandatory multimedia (graphic) presentation, reflecting the main content of the GQP.

At the end of the report, the defenders give oral answers to questions that have arisen from the members of the SEC on the subject, structure, content or design of the GQP and the profile of the HEP HE. The report and / or answers to the questions of the SEC members may be in a foreign language.

The stages of the GQP implementation, the requirements for the structure, volume, content and design, as well as the list of mandatory and recommended documents submitted for defense are indicated in the relevant guidelines.

The evaluation of the results of the GQP defense is carried out in accordance with the methodology set out in the evaluation materials presented in the Appendix to this FSE program.

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

To prepare for the state exam and the defense of the GQP, students use the premises for independent work.

To conduct the test part of the state exam, a classroom is required, equipped with workplaces with personal computers (at least 12), equipped with the necessary software and connected to the Internet.

To conduct the main part of the state exam and/or defense of the GQP, a classroom with a capacity of 12 or more people is needed, in which workplaces are equipped for all members of the SEC, with the ability to listen to reports, view public presentations of speakers, keep records and protocols; there are places for listeners wishing to attend the GQP defense procedure. The required premise equipment includes:

- equipment for public presentations of GQP results, including a multimedia screen, projector, audio equipment.
- a board for illustrating answers to questions;
- tablets/stands of not less than A1 format (if necessary) to place the graphic part of the GQP on them.

The student can notify the issuing department in writing about the needs for additional material and technical equipment (if necessary) in the audience assigned to defend the GQP, 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 defence:

The main literature is indicated in the work programs of the disciplines / modules of the educational program (in preparation for the state exam).

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

Additional literature indicated in the work programs of disciplines / modules of the educational program.

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
- 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/>
- 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. Guidelines for the implementation and execution of the GQP in accordance with the HEP HE "Oil and gas engineering / Oil and gas production and transportation technologies".

2. The procedure for checking the GQP on the matter of the amount of borrowing in the Antiplagiat system.

3. The procedure for conducting the FSE in accordance with the HEP HE "Oil and gas engineering / Oil and gas production and transportation technologies" using DLT, incl. graduate identification procedure.

*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.

* The assessment materials and the grading system are formed on the basis of the requirements of the relevant local normative act of RUDN University (regulations / order).

Head of the Department:

Head of the Department of Mineral De-
veloping and Oil&Gas Engineering

Name of Department

Kotelnikov A.E.

Full name

Head of Educational Programme:

Professor of the Department of Mineral
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Position, Department

Kapustin V.M.

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