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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)

Approved at the meeting of Academic
Council of the Academy of Engineering
Protocol №. 2022-08/24-11/1
date 11.29.2024

PROFESSIONAL EDUCATION PROGRAMME OF HIGHER EDUCATION

Field of Studies / Specialty:

2.1.6 Hydrotechnical structures, hydraulics and engineering hydrology

(scientific speciality code and title)

Profile / Specialisation

Hydrotechnical structures, hydraulics and engineering hydrology

(PhD program title)

The Educational Programme is developed in compliance with:

Educational Standard of RUDN University, approved by order of the Rector of RUDN University No. 139 dated March 9, 2022.

Length of Educational PhD Programme:

4 years

(full-time education)

Educational PhD Programme Features: programme is implemented in English

AGREED by:

Head of Educational
Programme
Ponomarev N.K.

(signature)

Head of Educational Policy
Department
Vorobyeva A. A.

(signature)

Head of Academy
Razoumny Yu. N.

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Head of PhD Study
Department
Borisova A. S.

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2025 г.

1. EDUCATIONAL PROGRAMME GOAL

The goal of the PhD program is to prepare and defend a dissertation for the degree of Candidate of Sciences in the scientific specialty 2.1.6 Hydrotechnical structures, hydraulics and engineering hydrology.

2. BRIEF SUMMARY OF THE PROGRAMME

Level of higher education - postgraduate studies - training of highly qualified personnel.

The term for obtaining education under the postgraduate program in full-time education, including vacations provided after passing the state final certification, is 4 years.

The volume of the postgraduate program is 240 credits and includes all types of classroom, independent and research work of a postgraduate student, internship, as well as the time allotted for quality control of mastering the educational program by a postgraduate student.

The types of professional activity of the graduate are research activities in the field of construction engineering and technology and teaching activities in educational programs of higher education.

The place of implementation of the program is the Engineering Academy of the Peoples' Friendship University of Russia (Russia, Moscow).

3. LABOR MARKET NEEDS FOR PERSONAL TRAINING IN EDUCATIONAL PROGRAMME PROFILE

Postgraduate studies allow to prepare scientific and teaching staff in the direction of training of the subgroup "Construction", the group of scientific specialties "Construction and architecture", the scientific specialty "Hydrotechnical structures, hydraulics and engineering hydrology", meeting the dynamically changing requirements and conditions in the modern labor market, in the main areas of professional activity in the field of construction, possessing modern methods of assessing technical and regulatory documents, systematized ideas, knowledge, skills and abilities in the field of practical activity, as well as the necessary skills and abilities of scientific research work.

The program for training scientific and scientific-pedagogical personnel in postgraduate studies in the scientific specialty "Hydrotechnical structures, hydraulics and engineering hydrology" enables the graduate to solve the following professional problems:

1. Methods of physical and mathematical modeling of the operation of earth, concrete and reinforced concrete dams; buildings of hydroelectric power plants, other structures involved in the creation of a pressure front, and their foundations in various natural, climatic and seismic conditions.

2. Development of scientific foundations, methods for calculating and designing water-conducting hydraulic structures.

3. Designs of canals for various purposes, their linings and facings. Methods of hydraulic calculation of canals. Designs of regulating, coupling and water-conducting structures on canals. Hydraulic tunnels: designs, hydraulic operating modes, finishing and methods for their calculation.

4. Theory and methods of substantiation, design, construction, operation, repair and reconstruction of dams made of earth materials, concrete and reinforced concrete water-retaining hydraulic structures, water-conducting and culvert hydraulic structures, hydraulic structures of melioration systems, river and sea port structures, structures on the continental shelf, erected in various natural and climatic conditions, including the Arctic and seismic hazard zones.

5. Stationary and non-stationary fluid flows in pipes, natural and artificial channels, hydraulic structures for various purposes. Interaction of flows with surfaces, bodies and structures. Hydraulic resistance.

6. Hydraulics of water management, hydropower, transport and nature protection hydraulic structures.

7. Turbulence of flows in natural and artificial channels, pressure systems and structures. General and local deformations of channels and pools of hydraulic structures.

8. Operational reliability of hydraulic structures, development of new criteria for their safety, new systems for monitoring and observing structures, improvement of methods for technical diagnostics and monitoring of water systems and objects.

4. REQUIREMENTS FOR APPLICANTS APPLYING TO THE PHD PROGRAMME

Persons with at least a higher education (specialist or master's degree) are allowed to master the programs for the training of scientific and pedagogical personnel in graduate school.

Applicants take entrance examinations on:

- a special discipline corresponding to the direction of training of scientific and pedagogical personnel in the postgraduate study of the subgroup "Construction", the group of scientific specialties "Construction and architecture", the scientific specialty "Hydrotechnical structures, hydraulics and engineering hydrology".

Entrance examinations are conducted in writing (special discipline).

To master the postgraduate program in the direction of preparation of the subgroup "Construction", the group of scientific specialties "Construction and architecture", the scientific specialty "Hydrotechnical structures, hydraulics and engineering hydrology", you must have the following knowledge, skills and abilities:

- knowledge of general theoretical categories and concepts of building science;
- knowledge of the basic concepts and concepts in the scientific specialty "Building designs, buildings and constructions", as well as the main scientific works of scientists and methods for calculating building structures;
- ability to search and apply normative and technical documents; - the ability to write scientific articles;
- the ability to master educational and scientific literature, express their thoughts and participate in the discussion of the identified problems;
- writing skills;
- skills to perform research work;
- the ability to select, study, analyze, discuss monographic and other scientific research.

5. STRUCTURE AND WORKLOAD OF THE EDUCATIONAL PROGRAMME FOR PhD STUDIES

Duration of mastering the postgraduate program: 4 years.

Form of education: full-time.

One credit unit corresponds to 36 academic hours.

No.	PhD programme structure	Workload, credit units
1	Scientific Component	210
1.1	Research activity aimed at preparing for a thesis defense	178
1.2	Preparation of publications and (or) patent applications provided for in paragraph 5 of the Educational Standard of RUDN University	24
1.3	Intermediate certification at the stages of scientific research	8
2	Educational Component	24
2.1	Disciplines (modules)	13
2.2	Internship	5
2.3	Intermediate certification in disciplines (modules) and internship	6
3	Final attestation	6
PhD programme workload in credit units:		240

6. CHARACTERISTICS OF EDUCATIONAL PROGRAMME GRADUATE'S PROFESSIONAL ACTIVITIES

Area of professional activity.

The field of professional activity of graduates who have mastered the postgraduate program includes:

- creation and improvement of rational types of structures, buildings, structures for various purposes and their complexes, as well as the development, improvement and verification of methods for their calculation justification;
- improvement of existing and development of new machines, equipment and technologies necessary for the construction and production of building materials, products and structures;
- improvement and development of new building materials;
- solving scientific problems, tasks in the relevant construction industry, which are of great socio-economic or economic importance;
- updating and improving the regulatory framework of the construction industry - in the field of designing construction projects;
- conducting educational and educational-methodical work in educational institutions of higher education.

Objects of professional activity.

The objects of professional activity are:

- building structures, buildings, structures and their complexes, including hydrotechnical, environmental structures and transport infrastructure facilities;
- loads and impacts on buildings and structures; building materials and products;
- machines, equipment, technological complexes, automation systems used in construction.

Types of professional activity.

- Types of professional activities for which graduates who have mastered the postgraduate program are preparing:
- research activities in the field of technical sciences and architecture;
- teaching activity on educational programs of higher education.

7. LOCATION OF IMPLEMENTATION OF THE PHD PROGRAMME

The PhD program is implemented by the Federal State Autonomous Educational Institution of Higher Education Peoples' Friendship University of Russia named after Patrice Lumumba.

The information about partner organisations involved in the implementation of the PhD programme:

Internship and Scientific Research	Internship location
Pedagogical Training (stationary)	RUDN University, Moscow
Research activity aimed at preparing for a thesis defense (stationary)	RUDN University, Moscow; Third party organizations performing research and development, depending on the focus of the research

8. FEATURES OF EDUCATIONAL PROGRAMME IMPLEMENTATION

The PhD program is implemented with elements of DET (based on the TUIS platform).

The language of implementation of the PhD program is English.

The program is not adapted for teaching the disabled and people with disabilities.