

**EDUCATION PROGRAM**  
**"ENVIRONMENTAL ENGINEERING IN CONSTRUCTION"**  
*(Peoples' Friendship University of Russia named after Patrice Lumumba (RUDN University) jointly with the National Research Moscow University of Civil Engineering (National Research University), MGSU»*

**Forms of study:** Full-time, part-time

**Language of instruction:** English, Russian

*Contact in National Research Moscow University of Civil Engineering (National Research University), MGSU*

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## **1. About the profession**

Ecology and construction are two major high-tech and knowledge-intensive fields, and the sustainable development of cities, regions and the country as a whole is impossible without them, and this is why the industry always requires a new generation of qualified personnel.

In today's world, a great deal of attention is paid to ecology and environmental management. Ecological thinking has become a professional skill that determines economic, political and social development. In fact, the concept of "ecology" includes not only clean air, rivers with clear water, absence of garbage; It also involves people's health, sustainable economic development, and social opportunities. Without environmental assessment, no project can be implemented.

Builders are people of the most peaceful and creative profession. Their focus is on the calculation, design, and exploitation of capital construction projects, engineering networks, and managing cities in general.

Improving the surrounding environment through applying modern technologies to manage its quality, improving the quality of life and the rational use of resources, is one of the fastest-growing areas of human activity.

Professional work of graduates of the master's degree aims to ensure human safety in the modern world. It can be achieved by construction and operation of facilities, using of environmentally friendly materials and structures, managing projects to form a comfortable for human life and activity technosphere, minimizing the technogenic impact on the natural environment, preserving human life and health by using modern technical means, methods of control, monitoring and forecasting.

## **2. The learning process**

The mission of the joint interdisciplinary educational program of the Russian Peoples' Friendship University named after Patrice Lumumba and the Moscow State of Civil Engineering University "Environmental Engineering in Construction" is the joint training of highly qualified specialists in the field of environmental construction and energy efficiency.

"Environmental Engineering in Construction" is a program within two training areas: 05.04.06 "Ecology and Nature Management" (RUDN) and 08.04.01 "Construction" (NRU MGSU).

A lot of attention in the program is given to the advanced studies of physical and chemical regularities, processes of obtaining drinking water from surface and underground sources, treatment of domestic and industrial wastewater of cities and industrial enterprises, technologies of disinfection of treated water and utilization of resulting sediments, which allow reducing the negative impact of industries on the environment. The issues of monitoring the quality of water bodies, modeling and optimization of technological processes of water treatment, environmental impact assessment of wastewater treatment and sludge treatment facilities, integrated management of water resources of territories are studied in this program in depth.

The program includes studies of the impact of construction projects on the environment, the causes, consequences and measures to prevent negative impacts on the environment, including modern green and energy-saving technologies, aimed at the careful and rational use of natural resources.

Among the subjects studied in the program are such ones as:

- Leadership and Team management (NRU MGSU);
- Foreign language for professional communication (RUDN);
- Regulation System in Construction (NRU MGSU);
- Organization and management in construction (NRU MGSU);
- Digital technologies in construction (NRU MGSU);
- Environmental rationing (RUDN);
- Urban water management and climate change adaptation (RUDN);
- Project management (RUDN);
- Territorial planning of cities and environmental management (RUDN);
- Sustainable development of urban areas (RUDN);
- Regional and municipal waste management systems (RUDN);
- Urban development and environmental engineering surveys (RUDN);
- Regional geoecology and urban geoecology (RUDN);
- Natural water conditioning systems (RUDN);
- Environmental control and monitoring of urban environment (RUDN);
- Blue-green urban infrastructure (RUDN);
- Hydrological Modelling (RUDN);
- Life cycle analysis of construction object (NRU MGSU).

The program is implemented with distance learning technologies elements, such as TUIS, MOOC, lectures/seminars are holding on the Microsoft Teams platform. Training is carried out simultaneously (in parallel) in RUDN and MGSU, thereby the schedule of the educational process allows studying with minimal discontinuity from work, or from any other individual educational track.

Head of the educational program of the master's degree is, a recognized expert in the field of construction and environmental safety, a scientist who has experience in practical work and in leading "The Scientific Research and Design Institute" for over 20 years, Ph.D in Engineering, Associate Professor, corresponding member of the Russian Ecological Academy and Academy of Quality Problems, full member of the Russian Society of Construction Engineers (RSCE), Director of the Scientific Center "Rural Urban Framework Center" at the Institute of Environmental Engineering of the RUDN University, Dmitry Kucher.

At the end of training, students pass the interdisciplinary state exam and defend the final qualifying work of the master in front of unified state certification committee, consisting of professional practitioners of leading enterprises in the industry and recognized members in the academic community.

Students who have successfully completed the educational program are awarded two state diplomas and are awarded the qualification:

- Master's degree in "Ecology and Nature Management" ("Peoples' Friendship University of Russia named after Patrice Lumumba");
- Master's degree in "Civil Engineering" (National Research Moscow State Construction University).

### **3. Practical Training**

Throughout the educational processes of the program, research work is carried out, during which students participate in Russian in international scientific and technical events, publish scientific articles, participate in hackathons, seminars, meetings with industry experts, and communicate with representatives of leading design, construction enterprises, consulting organizations and scientific research institutes.

The practical training takes place at enterprises of the industry. The key criterion is the company's affiliation to the implementation of projects in the field of construction, protection and environmental protection. They include "VidProject" Research and Design Institute, "Grazhdanproekt" Design and Exploration Organization, large construction companies of Moscow and Moscow region, expert organizations, scientific research institutes and other design, exploration and construction companies.

The leading professors of (RUDN) and (NRU MSCU) supervise the practical training.

The practical training is carried out in accordance with the curriculum and the schedule of the educational process in the second and fourth semesters.

#### 4. Career

Graduates of the program, receiving theoretical and practical training are up to date with the scientific and technical level and are highly qualified specialists in demand. By being fluent in information technologies, having the skills of independent scientific and practical activity, the ability to use normative documents and perform calculation tasks, graduates of the program have a wide range of employment opportunities for different vacancies and positions, such as chief engineer, project manager, head of technical supervision department, etc.

The designer of new cities, based on ecological biotechnology, specializes in the fields of construction, energy, and pollution control. This profession is already in demand now - high-tech "green cities," and the opportunity to combine getting a profession in two areas of training with studying a foreign language in the field of professional competence opens up employment prospects not only in leading Russia's companies, but also in international companies. Obtained competencies provide an opportunity to become one of the best specialists, who will be able to design, establish, operate and improve environmental technology; organize environmental protection work at enterprises and territorial-industrial complexes; carry out the examination of construction projects, technologies and productions, in order to achieve maximum environmental safety of human economic activity, and reduce the risk of anthropogenic impact on the environment.

##### Career paths for graduates of the program:

- Work as specialists and managers in companies involved in the design and implementation of projects related to the construction of both new and with the re-profiling, reconstruction of existing construction facilities of various purposes;
- Work in the field of operation, reconstruction, repair and modernization of water supply and sewage systems and facilities in cities and production facilities for various purposes;
- Work in state and private property management companies in the field of urban and municipal services;
- Work in state agencies regulating environmental and construction activities;
- Work in various organizations implementing private, state orders and target programs in the field of construction and ecology.

According to sociological research, the percentage of graduates' employment in construction and housing and communal services exceeds 90%, in ecology and nature management reaches 100%. The interdisciplinary program with diplomas of two leading universities will allow the graduate to be beyond competition in the labor market and find a leading managerial position in modern large Russian and international companies.