

ACADEMY OF ENGINEERING

HYDROTECHNICAL CONSTRUCTION AND WATER USE TECHNOLOGIES

MASTER'S PROGRAMME DEGREE

PROGRAM ADVANTAGES

Discover the World

world b

}aŭ

in One University!

- Knowledge of methods and software for calculating hydraulic engineering objects allows graduates to carry out calculation support for design and working documentation, registration of completed design work.
- Knowledge of the specifics of design allows graduates to prepare a feasibility study and make design decisions for the facility as a whole, coordinate work on parts of the project, design parts and structures of hydraulic spillway structures.
- Possession of tools for mathematical modeling of processes in structures and systems, computer methods for the implementation of models, development of calculation methods and design automation tools allows you to take part in all stages of the design of hydraulic structures.
- Thanks to knowledge in the development and organization of environmental safety measures for hydraulic facilities, graduates can monitor their compliance and participate in the development of measures to increase the reliability and safety of hydraulic facilities.
- ✓ The opportunity to get acquainted with the real problems in the field of hydraulic engineering and the practical relevance of this profession when communicating with fellow students from other countries, purposefully entering this specialization in connection with the need to build and monitor the reliability of hydraulic structures in their countries.
- ✓ The opportunity to get not only professional education, but also to improve the level of a foreign language, communicating with fellow students from other countries in which this profession is especially in demand, which allows students to dive deeper into the issues studied and expand the opportunities for practicing and internships in foreign companies and at real facilities.



STUDYING PROCCESS

120 credits.

Lectures, practical classes and independent work, several types of practice: research, technological, pedagogical, pre-diploma.

SPECIAL HYDRAULIC ENGINEERING AND WATER MANAGEMENT STRUCTURES

- Purpose, design features, calculation methods for the following structures: gateways-regulators, siphons, aqueducts, ship-forestry-fish passes, fish protection, anti-mudflow, anti-erosion.
- Calculation and layout of river waterworks.
- Types and features of water supply facilities.
- -• Dukers and pipes on channels, their design features and calculation.
- Aqueducts, mudflow conduits and chutes, their design features and calculation.
- Hydraulic tunnels, their design features.

MODELING OF HYDRAULIC ENGINEERING AND WATER MANAGEMENT STRUCTURES

- -• Simulation concept.
- -• Types of modeling.
- Numerical modeling of the operation of hydraulic structures using modern software systems.
- Integrated natural environment ecosystems of the location of hydraulic structures.
- Geographic information systems.
- Numerical methods.
- The use of standard software and computing systems for calculations and modeling of the operation of hydraulic and water facilities.
- Development of computer tools for numerical modeling and calculation of structures.



RIVER HYDRAULICS

- -• Basic equations of steady-state uneven water movement in an open channel.
- -• Methods for constructing curves of the free surface of river flows.
- -• Equations of turbulent diffusion and turbulent heat conduction.
- Equation of steady-state turbulent diffusion in the form of finite ones.
- Taking into account the initial and boundary conditions when calculating diffusion.
- Calculation of the dilution ratio by the Frolov-Rodziller and Lapshev methods.
- Channel processes and deformation of river channels.

SEISMIC RESISTANCE OF HYDRAULIC AND WATER FACILITIES

- General issues of seismic resistance of structures.
- Methods for determining seismic forces and calculations of structures for seismic loads.
- Methods for determining seismic forces and calculations of structures for seismic loads.
- Principles of earthquake-resistant construction of hydraulic and water facilities.

OUTDOOR WATER SUPPLY SYSTEMS

- -• The main tasks of the city water supply.
- -• Sources of water supply (selection of a sanitary protection zone).
- Requirements for water quality for various categories of consumers.
- Basic water purification schemes (filtration, biological treatment).
- -• Norms and modes of water supply.
- -• Water supply systems.
- Intake facilities.
- Water pressure and control tanks.
- External water supply network.
- Protection of natural water sources.



ENGINEERING HYDRAULICS

- Theoretical prerequisites for hydraulic calculations of structures.
- Basic equations of steady-state uneven water movement in an open channel.
- -• Coastal spillways.
- -• Dam spillways.
- -• Effects of high-speed flows on structures.

HYDROLOGICAL AND TECHNICAL SAFETY OF STRUCTURES

- -• Safety of hydraulic structures.
- Protection of the public and personnel in emergency situations
- _ Introduction to the theory of reliability.
- -• The current state of hydraulic structures in sea and river conditions.
- Natural factors affecting the strength, stability and durability of the gas turbine engine.
- -• Technogenic loads and impacts on hydraulic structures.
- -• Maintenance of hydraulic engineering and water management structures.
- Regulatory framework for the safety and operation of hydraulic structures.
- Basics of operational reliability of GTiVS and verification calculations.
- Safety of hydraulic structures.
- Protection of the public and personnel in emergency situations.



RIGOBERTO SANTOS ILARIO (REPUBLIC OF THE DOMINICAN REPUBLIC)

I studied at RUDN University from 1978 to 1984 with a degree 66 in Hydraulic Engineering and Water Management Technologies and received a Master's degree in Hydraulic Engineering. During my student life in this high school of study, I had the opportunity to count on excellent professors, scientists and doctors of hydraulic sciences who taught me how to design and build large hydroelectric dams, perimeter irrigation dams, aqueduct intakes, irrigation canals and related work. In 36 years of professional practice, I have been my country's vice minister of public works and communications, head of the construction department for large aqueducts, dams, irrigation systems, highways, roads and buildings. I am currently working as the CEO of my company CONSUDOM SRL, which is engaged in the construction of private housing projects and school buildings in the public sector. Undoubtedly, our successful professional career in our country is due to the high level of knowledge gained at RUDN University and the annual practices that we received from our Alma Mater - RUDN University.





LUIS EDUARDO TOYOS GRELLO (REPUBLIC OF THE DOMINICAN REPUBLIC)

L am Dominican by nationality and from the bottom of my heart I thank the Peoples' Friendship University of Russia for the fact that I received a professional education and formed solidarity and international friendship. I studied at RUDN University in our beloved and memorable hydraulic engineering, where we received unconditional support from incredible, fantastic and excellent professors so that we could receive a diploma in hydraulic engineering with a master's degree in hydraulic engineering. In this area, we remember the professors who expressed in us a sense of professional responsibility not only by their teaching, but also by their example. In academia, apart from lectures and group sessions, I especially mention the excellent laboratories where we have seen, analyzed and applied theories in practice. I mention a very important practice at the end of the year in career-related projects, where we were able to apply knowledge and work directly on important projects of large hydraulic valves, where we exchanged culture with the residents of those places. Since defending my diploma in the feasibility study of the two variants of the Sabaneta dam, built in the Dominican Republic, I have worked for many years in the design of hydraulic structures (aqueducts, sanitation and rainwater systems) in the city of Santo Domingo for Acueductos y Alcantarillados, as a supervisor of small Hydropower Projects Department of Hydropower Development Corporation Dominicana de Electricidad, CDE, led the cross-border design department of the National Institute of Hydraulic Resources, INDRHI, worked as an engineer in charge of the design and engineering department of small dams, mini-hydroelectric power plants and adaptation of canals in the Projects Department of the National Institute of Hydraulic Resources. INDRHI, etc.



HEAD OF THE PROGRAMME

PONOMAREV NIKOLAY KONSTANTINOVICH



Candidate of Technical Sciences, Professor of the Department of Construction of the Engineering Academy

Honored Worker of Higher Education, Corresponding Member of the Russian Academy of Natural Sciences (RANS), Honored Worker of Higher Education of the Russian Federation.

Thesis topic: "Stable forms of river channels and canals."

RESEARCH INTERESTS:

river hydraulics, hydraulics of spillways of hydraulic structures.

Author of more than 80 scientific articles in peer-reviewed Russian and foreign scientific journals (VAK, SCOPUS, Web of Science), regularly speaks at conferences. Co-author of a number of textbooks.