



CIVIL ENGINEERING AND BUILT ENVIRONMENT

ENGLISH LANGUAGE

MASTER'S PROGRAMME DEGREE



PROGRAM ADVANTAGES

- ✓ Knowledge of the specifics of the design of building structures of buildings and structures determines the demand for graduates in design organizations and at construction sites.
- ✓ Feature of training - the ability to choose an individual learning path and many individual and group assignments.
- ✓ Regular lectures and master classes from invited Russian and foreign practitioners.
- ✓ The multilevel education system “Bachelor - Master - Candidate of Science (Ph.D)” and training under the credit system enables RUDN University students to receive supplements to a pan-European diploma (Diploma Supplement) in 5 foreign languages, as well as to participate in academic exchanges with other universities in the world.
- ✓ The opportunity to participate in scientific circles, develop individual and group projects, participate and win in youth competitions, participate in conferences and get acquainted with the same active students from other universities, countries, strategies.
- ✓ Considerable attention is paid to the acquisition of skills in numerical modeling and computer design in the software systems most known to the international engineering community.
- ✓ All disciplines are taught exclusively in English, which allows you to acquire communication skills in English, familiarize yourself with professional terminology and prepare for potential future work in international companies.
- ✓ Teaching is conducted based on design standards in the United States and Eurocodes, which allows students in future employment in an international company without an additional adaptation period.



STUDYING PROCCESS

120 educational credits.

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



SPECIAL SECTIONS OF HIGHER MATHEMATICS

- Differential equations, reduction to canonical form, the concept of setting boundary and initial conditions, d'Alembert method, correct statement of the problem, solution of the problem of string vibrations by Fourier methods, boundary value problems for trigonometric functions, wave equation.



LINEAR SHELL THEORY

- The geometry of thin elastic shells, the first and second quadratic forms of surfaces, parametric, explicit and implicit forms of specifying surfaces, moment and momentless theories of thin elastic shells, equilibrium equations, physical equations, equations of continuity of deformations, internal forces and moments, boundary conditions in the theory of shells.



DESIGN OF REINFORCED CONCRETE STRUCTURES

- Concept of design of reinforced concrete structures, design rules and regulations, impurities, prefabricated loads, dead weight, moving load, selection of design loads, bending calculation and analysis of the strength of beams according to the ACI code, ultimate or standard bending moments, design methods of reinforced concrete structures, analysis and design I-beams, L-beams and T-beams, determination of steel area when the beam dimensions are specified, distribution of moments in slabs, shear stresses in concrete beams, concrete shear strength, design of columns, limiting states of structures.



STEEL STRUCTURES (SPECIAL COURSE)

- The design frame of the steel frame of a multi-storey building, determination of the load and impact, the effective transverse frame of the steel frame of a multi-storey building, the general design transverse frame of the steel frame of a multi-storey building based on the flat FE model, the general design frame of the steel frame of a multi-storey building based on the FE model, a set of sections and verification strength of the main load-bearing elements of the steel frame of a multi-storey building, design truss, selection of sections and checking the strength of metal truss elements, study of the stress-strain state (SSS) of metal truss nodes based on flat (two-dimensional) and spatial (volumetric) FE models, design of a metal truss ...



MATHEMATICAL MODELING

- Linear programming models, linear models, dynamic programming models, optimization models (formulation of the optimization problem), mathematical modeling of the problem of creating the stress-strain state of structures, tools for solving practical, engineering problems, analytical and computational mathematical approaches to solving practical, engineering problems, methods for solutions of applied engineering problems.



SOFTWARE SYSTEMS FOR THE CALCULATION AND DESIGN OF STRUCTURES

- Computer-aided design systems (CAD), structural design, computer-aided design (CAD), computer-aided design, analysis and simulation of physical processes, performing dynamic modeling, verification and optimization of products (CAE), information modeling (BIM), AutoCAD, LIRA CAD , SCAD, etc.



FUNDAMENTALS OF STRUCTURAL DYNAMICS

- Dynamics of deformable systems, impact, free vibrations of rod systems, the occurrence of free vibrations, free vibrations of rod systems as systems with distributed mass, seismic loads and effects, approximate methods for calculating natural vibrations of complex systems, kinematic excitation of vibrations.



STABILITY OF STRUCTURES

- Forms of buckling, buckling, stability of systems with one or more degrees of freedom, static method, energy method, stability of plane bending of beams, stability of flat frames, stability analysis by displacement method.



INNOVATIVE COMPOSITE MATERIALS

- Different types of matrices of materials, reinforcement of composite materials, types of reinforcement, classification of composites by the type of reinforcing filler, by type of matrix, by purpose, depending on the type and location of fibers, isotropic and anisotropic composites, fiberglass composites, methods of production of composites, strength criteria and anisotropic composite materials, the Mises – Hill criterion, the Zakharov – Malmeister criterion, the Goldenblatt – Kopnov criterion, nanotechnology for the production of modern composite materials, carbon nanoparticles: fullerenes, nanotubes, astralenes, concrete modified with nanoparticles.



STUDENTS FEEDBACK



TESFALDET HADGEMBES GEBRE, ERITREA



The time I spent in the Master's program at RUDN University was incredibly satisfying. The master's degree at RUDN was very suitable for me, because it united my passion for civil engineering and opened many doors for me from the very beginning of my studies. My experience and desire set the stage for going to university and earning a Master's degree in Computational Civil Engineering with honors. During my graduate studies, I took rigorous courses in Mathematical Modeling, Computational Mechanics, Finite Element Methods, Construction Process Simulation and Advanced Steel Structural Design, which allows me to acquire a solid knowledge of civil engineering. They also instilled in me a heightened sense of responsibility as a future researcher and practitioner. The faculty's reputation for excellent teaching opportunities, in-depth coursework, research projects and a variety of laboratory work has allowed me to gain both practical experience and a well-grounded theoretical base, which in turn allows me to work with international scientists on important issues in our field. of interest.



ABDO SHAMSELDIN, EGYPT



After completing my Bachelor's Degree in Egypt, I had the opportunity to pursue a Master's degree in Civil Engineering in Theory and Design of Buildings and Structures. Studying there was quite interesting, because there are highly qualified teachers, and such responsive ones as Professor Vera Galishnikova and Dr. Gilles-Ulbe Mathieu, who are always ready to help. They are always ready to help and share their knowledge. In the educational process, classes related to real life problems were used, and in the classrooms, advanced and modern computer programs were used. The master's degree expanded my knowledge of construction and construction engineering and helped me complete my master's thesis in a good and well thought out condition. And this prompted me to continue my postgraduate studies at the RUDN University at the same faculty, which will ensure the successful completion of my postgraduate studies.





HEAD OF THE PROGRAMME

MARINA IGOREVNA RYNKOVSKAYA



Ph.D in Technical Science, is responsible for the international affairs of the Construction engineering department, associate professor.

Thesis on the theme: “Bending and problems of calculating thin elastic shells in the form of a direct and unfolding helicoid on the distributed load and draft of one of the curved supports.”

FIELDS OF SCIENTIFIC INTERESTS:

shaping shells of complex geometry, analytical methods of calculation, building structures, innovative technologies in the study and teaching of engineering disciplines, modern educational techniques.

The author of scientific articles in peer-reviewed Russian and foreign scientific journals (Higher Attestation Commission, SCOPUS, Web of Science), regularly gives speeches at international conferences on engineering, including plenary and invited reports. Reviewer of the international journals Materials (Q2), Applied Sciences (Q2), Metals (Q2) and proceedings of international conferences. She has completed internships as a visiting researcher at CentraleSupélec (France), Esslingen Hochschule (Germany), Beihang University (China). For 10 years she worked in the construction industry at the design institute of the State Unitary Enterprise MO NIIPROEKT, also as a chief specialist.

The head of the student scientific club “Modeling and calculation of complex geometry shells.” The holder of the diploma of the best young university professor in Moscow among non-pedagogical universities. She continually receives grants from Russian and foreign scientific foundations for conducting research and organizing scientific events, including the Russian Federal Property Fund, the Ministry of Science and Higher Education, DAAD, the Potanin Foundation.