RUDN university

FACULTY OF SCIENCE

FUNCTIONAL METHODS IN DIFFERENTIAL EQUATIONS AND INTERDISCIPLINARY RESEARCH

MASTER'S DEGREE PROGRAMME

PROGRAM ADVANTAGES

- Graduate students can engage in research, are capable to solve relevant and significant problems of fundamental and applied mathematics, improve and implement new mathematical methods for solving applied problems in modern natural sciences, technology, economics and management, use knowledge in the field of mathematics during pedagogical activities.

- The research work and practices provided by the academic plan are carried out in the Scientific Center for Nonlinear Problems of Mathematical Physics of the S.M. Nikol'skii Mathematical Institute.

- Leading experts and employers' speakers from real sectors of the economics regularly deliver master classes and open lectures Russian and foreign world-class scientists are periodically invited to conduct a series of lectures and master classes on topical issues of pure and applied mathematics, and mathematical modeling

- Due to the international composition of the study group, you can create your own network of professional international contacts at the university and beyond.

STUDYING PROCCESS

120 credits
Lectures, practical classes and individual projects, research practice, teaching practice, undergraduate practice.

OPERATORS IN FUNCTION SPACES

- Theory of operators of harmonic analysis in various function spaces is presented.

- Shift operator, differentiation, Fourier transforms and Fourier multiplier operators, trace and continuation operators in spaces of basic and generalized Schwartz functions, Lebesgue spaces and spaces with bounded spectrum, spaces of differentiable functions of many variables are included into the course.

COMPUTER TECHNOLOGIES IN SCIENCE AND EDUCATION

- Principles of building parallel computing systems.
- Modeling and analysis of parallel computing.
- Evaluation of the communication complexity of parallel algorithms.
- Principles of development of parallel methods.
- MPI-based concurrent programming.
- Additional features.
- Parallel methods of linear algebra.
- Parallel sorting methods.
- Parallel methods on graphs.
- Parallel methods for solving partial differential equations.

ADDITIONAL CHAPTERS OF PARTIAL DIFFERENTIAL EQUATIONS

- The course is devoted to applied aspects of the theory of partial differential equations.

- The aim of the course is to study the apparatus of partial differential equations used in the description of physical processes.

- Linear partial differential equations of the second order are detailed considered.

- The course contains information on modern methods for the numerical solution of systems of partial differential equations.

- The methods of numerical solution are described on the example of discrete models built to implement the considered equations of mathematical physics.

STUDENTS FEEDBACK

👤 ASHOT MARGARYAN, RUSSIA

"I decided to continue my graduate studies. Formed in bachelor's studies, the theoretical base for analysis, differential equations and applications supplemented and expanded by numerous aspects, in particular, studies encountered in practice in the fields of interdisciplinary research. Choosing a program for studying in a magistracy, I looked for a place where I would not only get serious theoretical training, but also gain experience in solving modern problems in the field of differential and functional differential equations with applications to the natural sciences and industry, gain experience in a team of researchers. I was not mistaken with the choice. Master's program at RUDN University is an opportunity to learn from the best teachers, it is deep theoretical knowledge; it is the freedom to choose an interesting topic for your own research, the opportunity to participate in conferences and publish.

My graduate studies turned out to be amazingly interesting, necessary and very productive for me. This is a new level of thinking and preparedness, requiring great independence and diligence. In addition, this is a great chance to write a truly strong scientific research work. Not only his supervisor will help the student in this – almost any of the teachers will be happy to come to the aid. "

BURENKOV VICTOR IVANOVICH

Doctor of Physical and Mathematical Sciences, Professor of the S.M. Nikol'skii Mathematical Institute. In 2013, an honorary employee of University of Padua (Padua, Italy). He was awarded the title of Honorary Professor Emeritus of Cardiff University, Department of Mathematics (Cardiff, UK), the title of Honorary Professor of L.N. Gumilyov Eurasian National University (Nur-Sultan, Kazakhstan) and of Aktobe Regional State University (Aktobe, Kazakhstan). He was awarded honorary diplomas of the Ministries of Education and Science of Russia and Kazakhstan. One of the founders and editor-in-chief of the international «Eurasian Mathematical Journal».

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• He is a member of the International Society for Analysis, Applications and Computation (ISAAC). From 2003 to 2013 he was vice president of this society. In 2011, he was one of the organizers of the 8th ISAAC Congress, held at RUDN University (more than 400 participants from more than 30 countries).

• He created the course "Basic ideas of the theory of Sobolev spaces", which he taught at many universities in the world (in Russia, Armenia, Belarus, Kazakhstan, Great Britain, Germany, Italy, USA, Mexico, Colombia, Algeria, Ethiopia, Côte d'Ivoire, Pakistan, Japan).

• Scientific interests: functional analysis, PDEs, integral equations, applications to geophysics, quantum mechanics, numerical methods, radar theory, acoustics.

• He is an author of more than 180 articles. More than 100 plenary lectures have been delivered at conferences and by invitations of universities in more than 30 countries.

• Repeated recipient of grants from Russian and foreign scientific foundations for conducting research and organizing scientific events.