Mathematical modeling, numerical methods and complexies of programs (Mathematical modelling of nonlinear problems in physics and thechnology)

National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)

Degree or qualification is awarded: **Researcher. Lecturer-researcher**

Language of study: **Russian, English**
Mode of study: **full-time**
Duration: **4 years**
Availability of free education: **yes**
Price: **325 000 rubles per year**

Programme curator: **Nikolay A. Kudryashov**
Tel.: **Contact name: Olga N. Petukhova, Phone number. +74957885699, ext. 8045.**
E-mail: ONPetukhova@mephi.ru

Basic department: Applied Mathematics (№ 31)

Program manager: N.A. Kudryashov, Dr., Professor, Laureate of the State Prize of the Russian Federation, the RF Government Prize in Education, Honored Scientist of Russia, Head of the department №31.

Goals of the Program

Task training for organizations Rosatom, Research Center "Kurchatov Institute", foreign universities, and others.

Competitive advantages of the program

Strategic partners are the Department of State Corporation "Rosatom" and the leading organizations Academy of Sciences. Postgraduate training is conducted in priority areas of science, technology and engineering in the Russian Federation.
There are:

- specialized training program graduate, individual trajectories of training, academic mobility Intercollegiate;
- participation in the learning process leading industry experts and scientists Academy of Sciences and other universities, the practical work of graduate students in the research groups of the Russian Academy of Sciences and the "Rosatom";
- the selection of graduate students with the definition of the place of distribution in the organizations of "Rosatom" Institute, Research Center "Kurchatov Institute".

The program promotes the development of skills of independent research work at high professional level with self-assessment of performed works. The emphasis in the educational process is made on the practical application of acquired knowledge. Research and post-graduate training is carried out, including in the scientific organizations of the State Corporation "Rosatom" at the Institutes of Russian Academy of Sciences, Research Center "Kurchatov Institute", Joint Institute for Nuclear Research, and others. The main competitive advantages of the program are:

- Availability of unique courses;
- Highly - qualified teachers.

Characteristics of the scope and objects of professional activity of future graduates

The main sphere of professional activity of graduate school is to work with leading Russian and foreign research institutes and universities, large companies, banks and corporations, including the organizations of the State Corporation "Rosatom".

Objects of professional activity: mathematical modeling; mathematical modeling of nonlinear problems in physics

and engineering; mathematical physics; inverse and ill-posed problems; numerical methods; theory ofprobability and mathematical statistics; operations research and systems analysis; optimization and optimal control; mathematical cybernetics; discrete mathematics; nonlinear dynamics, computer science and management; mathematical models of complex systems theory, algorithms, and applications; mathematical and computer image processing techniques; mathematical and information support of economic activity; mathematical methods and software for information security; mathematical and software of computer networks; information systems and research methods of mathematical forecasting and system analysis; mathematical models and methods in the design of VLSI; analytic theory of differential equations; group theory; the mathematical theory of games; mathematical methods of theoretical physics; mathematical methods of data processing; high-performance computing and parallel programming technology; computational nanotechnology; intelligent systems; bioinformatics; software engineering; system Programming; tools, technologies, resources and services of e-learning and mobile learning; Internet technology applications; automation of scientific research; programming languages, algorithms, libraries and software packages, the products of the system and application software; system and application software; automated computer systems; application developer; database; enterprise management system; network technologies.

Brief description of the curriculum

Essential in the learning process given to scientific research in which graduate students acquire skills in research and analysis of scientific and technical information on the subject of research, modeling processes and facilities based on standard packages of numerical experiments and development of techniques for research, descriptions of ongoing research and the analysis of results; development of mathematical models of processes under study. The focus on drawing up surveys: reports and publications, the implementation of research results.

The base of industrial and/or scientific practice and employment

Students graduate pass scientific practice, perform research work and prepare the final qualifying work: Organizations of the State Corporation "Rosatom"; "Kurchatov Institute"; Institutes of the Academy of Sciences of Russia: Nuclear Safety Institute, "Keldysh Institute" et al.; The Joint Institute for Nuclear Research (Dubna); Overseas training and internships.

Specializations within this programme