

Methods of nonlinear dynamics and mathematical modeling

National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)

Degree or qualification is awarded: **Master's degree**

Language of study: **Russian**

Mode of study:

Duration: **2 years**

Availability of free education: **yes**

Price: **110 800 rub**

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The purpose of the program:

Preparation of highly qualified personnel in the field of applied mathematics, capable of improving and applying the modern mathematical apparatus for solving research and applied problems in their future professional activities.

Annotation:

A distinctive feature of the program from existing analogues is the focus on in-depth study of the modern mathematical apparatus and methods of its application in practice. So, masters in the framework of the educational program receive in-depth mathematical training in the field of methods of mathematical modeling and computational mathematics, methods of analyzing symbolic sequences and time series, mathematical statistics, methods of nonlinear mathematical physics, theory of differential equations, methods for processing experimental results and other branches of mathematics. At its core, the program is a reflection of the current state of mathematical science, which allows us to talk about the relevance of the program as a whole and the demand for graduates in the labor market.

Program relevance:

The rapid development of modern science and information technology creates an urgent need for specialists who are able to easily adapt to market requirements and effectively solve problems arising from the work of state and commercial enterprises. Global digitalization leads to the emergence of a huge number of tasks requiring an engineer's skills located on the border between applied mathematics and information technology, which explains the relevance of this program. The tasks successfully solved by our graduates include data analysis and processing, mathematical modeling of physical processes, optimization, software development for solving scientific and practical problems, etc..

Core disciplines:

- o Nonlinear mathematical model
- o Mathematical and computational mechanics of liquid and gas
- o Mathematical methods for processing data of chaotic time processes
- o Neural networks
- o Nonlinear partial differential equations
- o Numerical methods for solving problems on non-orthogonal grids
- o Mathematical modeling using application packages
- o Manufacturing practice

PROFESSIONAL ACTIVITY

Alumni Competencies:

Graduates of the program have universal and subject-specific competencies in the field of applied mathematics and

information technology, contributing to their social mobility, stability in the labor market and opportunities for professional growth. Graduates are able to apply their knowledge in the field of computational mathematics and modern IT technologies to solve applied problems of science and technology; capable of abstract thinking, work in a scientific team, can generate new ideas, improve and develop their intellectual and cultural level; capable of independent development and use of new research methods, as well as receive, analyze, process and critically evaluate information, be able to transmit and operate it; use modern computer technology; capable of professional communication in the state language of the Russian Federation and a foreign language.

Labor market demand:

Our graduates are in demand on the Russian and international labor markets and occupy leading positions in such state organizations and commercial companies, research institutes, universities and research laboratories

как:

- o Rosatom
- o University of Manchester, England
- o University of Göttingen, Germany
- o KTH Royal Institute of Technology, Sweden
- o Imperial college, London
- o Sberbank
- o Hewlett Packard
- o Mail.ru
- o Yandex
- o Oracle
- o Samsung

This list of enterprises indicates that graduates of the program are extremely in demand on the labor market and are able to apply the knowledge gained in the process of working in an enterprise of any level and profile of activity.

Practice and internships:

As part of the training, students practice at the international scientific laboratory "Methods of Nonlinear Mathematical Physics and Mathematical Modeling" NRNU MEPhI, in the largest scientific centers of the Russian Academy of Sciences, such as the Institute of Applied Mathematics M.V. Keldysh, SIC Kurchatov Institute, FIC "Fundamentals of Biotechnology" and others, in the enterprises of the state corporation ROSATOM, as well as in large IT companies.

Specializations within this programme