Methods of nonlinear dynamics and mathematical modelling (In English)

National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)

Degree or qualification is awarded: **Bachelor degree**

Language of study: **English**
Mode of study: **full-time**
Duration: **4 years**
Availability of free education: **yes**
Price: **213 460 rubles per semester**

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

The program purpose:
Formation of the basic theoretical knowledge and practical skills that contribute to intellectual, cultural and professional self-development in the field of mathematical modeling of physical processes.

The occupational field:
academic organizations related to the solution of scientific and technical problems; research and computer centers; scientific production association; institutes and educational organizations; government departements; organizations engaged in the development and use of information systems, scientific achievements, products and services in the field of applied mathematics and computer science.

Features of the curriculum:
The main feature of the educational process is the fundamental physical and mathematical preparation. The process of preparation of bachelors is based not only on the classic disciplines of mathematics and physics, but also on the original courses designed by outstanding in their subject areas scientists. In addition, during the preparation, significant attention is paid to development by bachelors courses on modern IT - technology, including the theory of programming languages, databases, and others. The knowledge and skills obtained by bavhlors are necessary for successful completion of the master's program.

Modules:
The curriculum consists of four modules distributed in eight semesters such as: humanitarian, natural-science, general professional and professional. Humanitarian module consists of basic humanitarian courses such as history, philosophy, social science and etc. Natural science module refer to studing the classical courses of mathematical analysis and theoretical physics. The main purpouse of the general scince module is to form the computer skills in the field of control and data processing. In turn, professional module consits of in-depth mathematical disciplines and involves the development of skills in the field of mathematical modeling of physical processes.
It should be noted that the centerpiece of the program takes research work under the guidance of prominent scientists involved in research projects in the relevant areas of fundamental and applied studies, which allows to generate the bachelor's ability to work in a scientific team, to generate new ideas and to demonstrate the skills of independent research work.

The list of enterprises for practice and employment of graduates:
Foreign and Russian research centers and universities; Enterprise State Corporation Rosatom; research institutes of the Russian Academy of Sciences (RAS) and other academic and research organization of high-tech industries of the Russian Federation, as well as large IT-companies and corporations.

The program of the continuous training: Bachelor's Degree-Master of Science-Post graduate

Programs for which the bachelors are trained:

“Training for the research centers”

“Nuclear Power of the New Generation in 2010 – 2020”,
"Innovative development Program of the Rosatom" and etc.

This programme is also available in Russian language.

Specializations within this programme

Applied Mathematics and Informatics

Objects of professional activity:
mathematical modeling; mathematical physics; inverse and ill-posed problems; numerical methods; theory of probability 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.