

01.03.02 Applied Mathematics and Informatics

Applied Mathematics and Computer Science

Program objective:

Formation of theoretical and practical knowledge and skills among students for future contribution to R&D for high-tech sectors of national and regional economy

The speed and development trends of modern science and information technology dictates an acute need for personnel capable of efficiently and efficiently solving problems arising in the process of functioning of public and commercial enterprises, quickly adapting to market requirements. In the context of global digitalization, a huge layer of problems arise that require a modern engineer to know what lies at the junction of applied mathematics and information technology, which ensures the program's relevance. As an example, we can give the tasks associated with the analysis and processing of data, mathematical modeling, optimization, the development of high-tech software for solving scientific and scientific-practical problems, etc., that program graduates cope with successfully.

The program is the quintessence of advanced mathematical and IT training. Students receive in-depth knowledge in:

- mathematical models development describing the behavior of complex systems of various nature (physical, economic, technological, etc.);
- mathematical algorithms and statistical data processing and data analysis methods (including neural network approaches and machine learning methods)
- modern programming languages, databases, network technologies and parallel programming technologies;
- digital software development and application.

Core disciplines:

- Numerical methods
- Data bases
- Optimization methods
- Concurrent programming
- Mathematical and theoretical physics
- Programming languages (C/C++, Python)
- Digital signal processing
- Introduction to neural network theory
- Statistics
- Computer processing algorithms
- Probability theory
- Data science

Practical training:

- MEPhI international research laboratory "Methods of Nonlinear Mathematical Physics and Mathematical Modeling";
- largest scientific centers of the Russian Academy of Sciences;
- the Institute of Applied Mathematics M.V. Keldysh,
- National Research Centre "Kurchatov Institute";
- Federal Research Centre "Fundamentals of Biotechnology";
- State Corporation ROSATOM enterprises;

- large IT companies.

Alumni key competencies:

- able to use and adapt existing mathematical methods and programming systems for the development and implementation of algorithms for solving various problems;
- able to understand, improve and apply modern mathematical apparatus;
- able to collect, process and interpret data;
- able to use modern computer technology, multiprocessor supercomputers and specialized software;
- able to think critically and creatively, rethink accumulated experience;
- capable of business communication in oral and written forms in Russian and English.

Future employment:

Program graduates are in high demand on the Russian and international labor markets and hold leading positions in the following public and commercial companies, research institutions and universities:

- Rosatom State Corporation
- University of Manchester (Manchester, UK)
- University of Göttingen (Göttingen, Germany)
- KTH Royal Institute of Technology (Stockholm, Sweden)
- Imperial college (London, UK)
- Sberbank
- Hewlett Packard
- Mail.ru
- Yandex
- Oracle
- Samsung