

## **Applied Mathematics and Computer Science**

**Level:** 01.03.02 Bachelor's Degree Subject: Applied Mathematics and Informatics

**Mode of study:** full-time Duration: 4 years

**Graduation department:** the program is implemented at the Department of applied mathematics (№31) of the Institute for Laser and Plasma Technologies of the MEPhI University.

**The purpose of the program:** Formation of theoretical and practical knowledge and skills of students for successful work in the field of research and development (R&D) in high-tech sectors of the economy

**Annotation:** This educational program is the quintessence of advanced mathematical training with training in the field of IT. In the process of mastering the program, students receive in-depth knowledge in the field of:

- development of mathematical models 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;
- development and application of digital software solutions for a wide range of tasks.

The central place in the curriculum of students is occupied by research work, under the guidance of scientists involved in scientific projects in relevant areas of basic and applied research. This allows students to develop the ability to work in a team, think critically, generate new ideas, and develop independent work skills.

**Program relevance:** 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 state and commercial enterprises, quickly adapting to market requirements. In the context of global digitalization, a huge layer of problems arises that require a modern engineer to know the knowledge that 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., which graduates of the program successfully cope with.

### **Core disciplines:**

Numerical methods- Data bases

Methods of optimization - 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

### **Alumni Competencies:**

Graduates of the program have special practice-oriented competencies in the field of applied mathematics and information technology. Graduates are able to use and adapt existing mathematical methods and programming systems for the development and implementation of algorithms for solving various problems, to understand, improve and apply modern mathematical apparatus; able to collect, process and interpret data; 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 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 such as:

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

**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.