

**Program** Quantum Engineering

**Level:** 03.03.01 Bachelor's Degree Subject: APPLIED MATHEMATICS AND PHYSICS

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

**Graduation department:** Institute for Laser and Plasma Technologies of the MEPhI University.

**Program supervisor** PhD Kirill E. Lakhmanskiy, head of the scientific group for the development of ion-based quantum computers at the Russian Quantum Center

**Annotation:**

The first quantum revolution that happened in the beginning of the XXth century revealed the quantum nature of our Universe. Now we are living in the era of the 2nd quantum revolution, where we can precisely manipulate single atoms, single particles. This is the era of the breaking new science and technology, which is called quantum technology. Dealing with the quantum physics demands new way of thinking. The new, «quantum», specialist should be able to use the power of highly counter-intuitive quantum laws and the practical physics to implement brand new technological solutions.

The Bachelor program «Quantum Engineering» is the result of the detailed work of the best specialists in the field of quantum technologies. Keeping the extensiveness of the Bachelor educational level, this program introduces its students to all of the three tracks of quantum technologies, namely quantum communication and cryptography, quantum computation and quantum sensorics. During the four years the students will be provided with the knowledge and skills in quantum physics, laser physics, quantum optics, electronics, programming, material science and others. Being designed accordingly with the current state of the science and technology, «Quantum Engineering» gets the students into the field step by step from the very 1st year, thus transforming them into deeply thinking and highly skilled demand specialists.

**Core disciplines:**

Quantum computing algorithms

Topology

Mathematical statistics and machine learning

Workshop on quantum sensorics

Laser physics

Workshop on quantum optics

Photonics

Programming (Python)

Linear algebra

**Practice and internships:**

Russian Quantum Center, Steklov Mathematical Institute of RAS, Moscow State University, JV Kvant (Rosatom)