

# Laser Physics

National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)

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

Language of study: **Russian**

Mode of study: **full-time**

Duration: **4 years**

Availability of free education: **yes**

Price: **80 860- 110 900 rubles per semester**

Programme webpage at the university website:

[http://eis.mephi.ru/AccGateway/index.aspx?report\\_url=/Accreditation/program\\_annotation&report\\_param\\_pid=68](http://eis.mephi.ru/AccGateway/index.aspx?report_url=/Accreditation/program_annotation&report_param_pid=68)

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**Field of study:** "Nuclear Physics and Technologies".

**Duration of training:** 4 years, 240 credits.

**Course delivery language:** russian.

**Basic department:** Laser Physics (No. 37)

**The continuous training program:** Bachelor's Degree - Master of Science.

The aim of the program: the training of the specialists in the field of social, economic, mathematical and natural science knowledge, high professional education, in order to work in the field of nuclear and radiation physics, laser physics and application, to have universal competence to obtain social mobility and labor stability.

**Field of profession:** the professional field of work of a bachelor graduate from the Department of Laser Physics is research and development, engineering, and management at Rosatom organizations: Dukhov All-Russia Research Institute of Automatics (Moscow), Russian Federal Nuclear Center - All-Russia Research Institute of Experimental Physics (Sarov), and Dollezhal Research and Development Institute of Power Engineering; institutes of the Russian Academy of Sciences: Prokhorov General Physics Institute, Lebedev Physical Institute; Alikhanov Institute for Theoretical and Experimental Physics; and Hi-Tech companies: NTO IRE Polus, TsNIChERMET, ESTO, etc.

Professional objects of the bachelor graduates of the program "Laser Physics" are creation and application of devices in the field of laser physics, nuclear physics and elementary particle physics, plasma physics, and solid state physics; creation of new laser technologies for testing and diagnostics (also for ecological monitoring), in particular, in medical physics and biophysics; creation of technologies for obtaining new materials with nanostructure, superconductivity, and new laser materials.

**Educations for programs:** "Specialists for scientific centers", "Nuclear Technologies of the New Generation for 2010-1020", "The Program of Innovative Development of the Rosatom", "National Technological Basis", etc.

**Educational plan:** The peculiarity of the program educational process is the combination of the fundamental theoretical and experimental physical and mathematical courses with computer courses and engineering courses. The main courses are quantum radiophysics and solid state physics. Before them there are such courses as oscillation theory, physical optics, and atomic and molecular spectroscopy. This knowledge is also based on the physical optics and laser physics practicum. The plan is oriented at the possibility of the following master education and professional training for scientific centers and institutes and high technological enterprises in the field of laser production and laser application.

Student R&D practice:

1. Educational practice during the 7th term (weeks of theoretical study).
2. Industrial practice during the 3rd term (June 29 – July 12).
3. Diploma practice during the 4th term (May 11–31).

### **Organizations for practice.**

Rosatom: Dukhov All-Russia Research Institute of Automatics (Moscow), Dollezhal Research and Development Institute of Power Engineering (Moscow), Russian Federal Nuclear Center – All-Russia Research Institute of Experimental Physics (Sarov); the Russian Academy of Sciences: Prokhorov General Physics Institute, Lebedev Physical Institute; Alikhanov Institute for Theoretical and Experimental Physics.

R&D work is possible in a wide range of themes ranging from the high power laser light interaction with different materials to the laser micro- and nanotechnologies and computer modeling. There exists a wide educational and scientific cooperation with the famous research centers in Russia, Germany, USA, China, France, and Great Britain.

### **Specializations within this programme**

#### **Nuclear Physics and Technologies**

Objects of professional activity: lasers and applications, laser technology, physical instruments and installations for plasma diagnostics, substances in gaseous and condensed state, nanomaterials, for the separation of isotopic and molecular compounds, mathematical models for theoretical, experimental and applied research of phenomena and laws in the field of plasma physics, gas and condensed matter, propagation and interaction radiation with materia.