

# Radiation ecology and Safety of a Human Being and the Environment

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: **316 290 rubles per semester**

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

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

**Course delivery language:** russian.

**Basic department:** Radiation Physics and Nuclear Technology Safety (No. 1).

**The program of continuous training:** Bachelor's Degree – Master of Science – Post Graduate.

Aim of the program: training of broad profile researchers in the field of nuclear and radiation safety.

Graduates from the program work, first of all, at enterprises and institutions of the nuclear industry and related fields, including principal institutes of the Russian Academy of Sciences, organizations of applied researches and design.

The Department of Radiation Physics and Nuclear Technology Safety has a 55-year history. During this period of time, many graduates from the Department came to nuclear industry and now work at different levels: from common specialists to top managers of the industry. For example, many of them work as leading researchers at scientific and design institutions and as heads of radiation safety services at nuclear power plants and nuclear-powered icebreakers. Some of them hold high posts in the Rosatom top management.

The programs of nuclear power industry development which are provided with trained specialists: "Radiation Safety of Nuclear Industry", "Training Specialists for Research Centers", "Nuclear Power Technologies of New Generation in 2010–2020", "Program of Innovative Development of the State Atomic Energy Corporation", and others.

Main fundamental and professional courses: theory of transport of ionizing radiation; physics of radiation shielding; radiation dosimetry, detecting and spectroscopy; instrumental techniques in radiation safety; fundamentals of nuclear technologies safety; risk assessment and risk management; medical and biological grounding of radiation safety; safe treatment of radioactive nuclear waste and used nuclear fuel; human physiology and biological effects of ionizing radiation.

On the basis of mathematics and physics students get fundamental knowledge in interaction of radiation with matter and propagation of ionizing radiation through matter. Graduates from the program are able to assess risk and apply methods of decision-making theory.

Graduates can skillfully use up-to-date dosimetric, detecting and spectroscopic equipment. They are acquainted with modern methods of radiation shielding calculation and design and are able to apply their knowledge to practical problems. They know how handle used nuclear fuel and radioactive nuclear waste and can do it practically.

**Practices.**

- Practical computing (part time practical exercises at semesters 6 and 7).
- Practical work at industrial, research and design organizations (for one week from June 29 to July 5 at semester 6).
- Undergraduate practice (for two weeks from May 18 to May 31 at semester 8).

List of organizations used for practical work and undergraduate practice: Institute of Safe Development of Nuclear Power; Scientific and Technological Center of Nuclear and Radiation Safety; Russian Research Institute of NPP Operation; Federal Medical Biophysical Center named after A. I. Burnazyan; Russian Federal Nuclear Center – All-Russia Research Institute of Technical Physics named after academician E. I. Zababahin; Russian Federal Nuclear Center – All-Russia Research Institute of Experimental Physics; National Research Centre "Kurchatov Institute", and other institutions of nuclear industry.

## **Specializations within this programme**

### **Nuclear Physics and Technologies**

Objects of the professional activity: a nucleus, particles, radiation influence of an ionising radiation to a human being and environment, mathematical models for theoretical and experimental research of spread of ionising radiation in a substance and radionuclides in nature areas; ecological monitoring of an environment; calculating of biological protection of any source of ionising radiation; dosimetric, radiometric, spectrometric devices, systems of radiation control of nuclear objects, technologies of application of tools and installations for measuring characteristics of a radiation field; evaluation of reliability of facilities of atomic industry, and risk of emergency cases and their consequences to human being and nature.