# Radiation safety of nuclear power plants

National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)

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

Language of study: **Russian**
Mode of study: **full-time**
Duration: **5,5 years**
Availability of free education: **yes**
Price: **91 000- 113 500 rubles per semester**

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The program purpose: Training of qualified researchers in the field of nuclear and radiation safety of nuclear technologies for NPPs, enterprises and institutions of nuclear industry and related fields, including principal institutes of Russian Academy of Science, organizations of applied researches and design.

Scope of professional activity of graduates includes:
means, methods and approaches of human activity directed to radiation and ecological safeguarding of industry that create or use radiation and nuclear technologies: nuclear medicine, NPPs and other nuclear power facilities that generate, transform or apply thermic and nuclear power. Besides it includes means, methods and approaches of human activity connected with assessment of nuclear industry reliability aimed to prevention of accidents and with researches of effects of atomic radiation on objects of live and inanimate nature.

Main fundamental and professional courses: Theory of transport of ionizing radiation; Physics of radiation shielding; Radiation dosimetry, detecting and spectrometry; 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. 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, develop new dosimetric, detecting and spectrometric equipment. They can skillfully use modern methods of radiation shielding calculation and design. They know how calculate the accumulation of radionuclides into reactor core and safely handle used nuclear fuel and radioactive nuclear waste. Graduates are able to apply their knowledge to practical problems of decommissioning of NPPs and other nuclear facilities.

Humanitarian module
Scientific module
Engineering module
Professional module

The range of professional work of graduates includes: the Russian Academy of Sciences Nuclear Safety Institute (IBRAE); the Scientific and Engineering Center for Nuclear and Radiation Safety; Science and Research Institute of Nuclear Power Plants and Utilities Operation; the Burnazyan Federal Medical Biophysical Centre (FMBA); Russian Federal Nuclear Center – Zababakhin All-Russia Research Institute of Technical Physics; Russian Federal Nuclear Center – All-Russia Research Institute of Experimental Physics; National Research Centre “Kurchatov Institute;” Moscow SIA “Radon;” National Research Institute for Physicotechnical and Radioengineering Measurements; Scientific Production Company "Doza"  and other scientific research institutes and construction departments of the nuclear industry. The same enterprises are places of industrial and scientific practice of masters.

## Specializations within this programme

### Nuclear power plants: design, operation and engineering

Objects for professional activity of the specialists graduated from the program: Physical, nuclear, thermo-hydraulic and electrical processes in facilities for generation, transformation and usage of nuclear and thermic energy; Nuclear

power thermo-mechanical and electrical equipment of NPPs and other nuclear power facilities; Processes and systems of parameters monitoring and control; Diagnostics of nuclear facilities state; Systems of safety and radiation shielding; Hardware/software subsystems, data and control systems of nuclear facilities; Automated systems of NPPs' technological processes control; Operation safety and radiation monitoring of nuclear facilities and objects.