Nuclear Power Engineering (in English)

National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)

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

Language of study: **English**
Mode of study: **full-time**
Duration: **2 years**
Availability of free education: **yes**
Price: **207 610 rubles per semester**

Programme curator: **Kutsenko Kirill**
Tel.: **Contact name: Olga N. Petukhova, Phone number. +74957885699, ext. 8045.**
E-mail: ONPetukhova@mephi.ru

The program provides specialized training in the following profiles:

Profile: "Radiation safety of humans and the environment"

Basic department: Department of Physics and Radiation Safety in Nuclear Technology (1)

The program's objectives: training of highly qualified scientists and engineers in the field of nuclear and radiation safety of nuclear technologies for enterprises and organizations of Rosatom and related industries, as well as the basic institutions of the Academy of Sciences of the corresponding profile.

Course duration: 2 years (Full-time courses at the undergraduate base)

The area of professional activity: includes a set of tools, techniques and methods of human activity related to radiation and environmental safety in all industries where are created or used radiation and nuclear technology to nuclear power stations and other nuclear power plants, producing, transforming and using heat and nuclear energy, but also to estimate the reliability of the nuclear industry element design to prevent accidents; study the impact of radiation on the objects animate and inanimate nature.

Objects of professional activity are: the atomic nucleus; elementary particles; radiation effects of ionizing radiation on humans and the environment; Mathematical models for the theoretical and experimental study of the spread of ionizing radiation in the material and radionuclides in the environment; Environmental monitoring of the environment; calculation of biological protection of any sources of ionizing radiation; dosimetric, radiometric and spectrometric equipment; system of radiation control of nuclear facilities, the use of technology devices and equipment for measurement of the radiation characteristics of the field; assessment of the reliability of the equipment of the nuclear industry; and the risk of accidents and their consequences for man and nature.

Features of the curriculum: The main subspecialties are: Nuclear physics and nuclear safety bases and nuclear technology; Numerical methods for the transfer of ionizing radiation theory; The reliability of the equipment of nuclear reactors and risk management; radiation monitoring systems; Radiometry and spectrometry neutron reactor; Dosimetry and radiobiological processes others. The program includes a number of additional professional elective courses students. Graduates are able to assess the risks and to apply methods of decision theory, develop new dosimetric, radiometric and spectrometric equipment, to practice modern methods of calculation and design of biological defenses, expect the accumulation of radionuclides in reactors and to use safe methods of dealing with irradiated fuel and radioactive waste, to solve the problem decommissioning of nuclear power plants and other nuclear facilities, worn out.

Profile: "Automation of physical units and their components"

Basic department: Automation Department (2)

The goal of the program: preparation of masters for businesses and Rosatom organizations, academic institutions

and industry, and other high-tech enterprises in the development and operation of control systems, control and automation of nuclear physics and power plants.

Duration of training: 2 years.

The area of professional activity: research, development and technology, aimed at the creation and development of methods and tools for measuring, recording and processing of information on the development and practical application of the theory in the field of creation and use of electronic, and software and hardware information and control monitoring systems, automatic and automated management of physical, including nuclear and nuclear-power plants, automation of physical experiments and research.

Objects of professional activity: a system of automatic and automated control of nuclear installations and their physical elements, electronic and electrical equipment and systems in nuclear and physical facilities, the system of radiation monitoring of physical plants and facilities, equipment measuring and monitoring systems, diagnostics, control and protection of nuclear physical facilities, the system of physical protection of nuclear facilities and materials, mathematical models of physical systems as the control and management of facilities, monitoring and control algorithms, information technology, and technology, software engineering analysis and computer-aided design systems and control and management, information technology, systems engineering, support and implementation stages of management information systems life cycle.

Features of the curriculum: the curriculum provides in-depth specialized training, including research work of students and innovative practice, realized in the laboratories of the University, and the basic facilities. A considerable amount of studies conducted in specialized teaching laboratories of the department with modern equipment and software, including the laboratory "Digital automatic control system." "Software and hardware complex of NPP APCS", "reactor physics, control and safe operation of nuclear power units of NPP", "Information technology and information-measuring systems", "Distributed Computer Measurement and Control Systems".

Profile: "Physics and thermal Physics of Nuclear Power Installations"

Basic department: Department of Theoretical and Experimental Physics of Nuclear Reactors (5), Thermal Physics (No. 13)
The master's program includes the disciplines of compulsory component, discipline of choice, practice, research work and work on the final qualifying work. A special place in the curriculum given to disciplines that help to understand the current challenges facing the nuclear industry. Physics of nuclear reactors, nuclear fuel cycle, input, output and operation of nuclear power plants, nuclear safety and control systems and the protection of nuclear power plants - a discipline that provide the necessary competence to solve problems for the development of nuclear energy.

The area of professional activity of graduates of the master's program includes:

A set of tools, techniques and methods of human activity related to the development, creation and operation of facilities that produce, transform and use of nuclear energy. Graduates are in demand in high-tech industries, which are implemented and improved processes with innovative solutions to complex.

Specializations within this programme