

Nuclear power installations, including design, operation and decommissioning

National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)

Degree or qualification is awarded: **Researcher. Lecturer-researcher**

Language of study: **Russian, English**

Mode of study: **full-time**

Duration: **4 years**

Availability of free education: **yes**

Price: **413 400 rubles per year**

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Basic department:Theoretical and experimental physics of nuclear reactors (№ 5)

Goals of the Program

Higher professional education, that allows graduates to work successfully in the field of activities related to fundamental and applied problems of nuclear technology, and to have universal and subject-specialized competencies, promoting his/her social mobility and stability in the labour market.

Characteristics of the scope and objects of professional activity of future graduates

Tools, techniques and methods of human activity related to the design, development and operation of facilities and plants, producing, transforming and utilizing thermal and nuclear energy. Research, development and technology, aimed at the registration and processing of information, development of the theory, development and use of plants and systems in the field of atomic physics, radiation medical physics, radiation material science, the study of non-equilibrium physical processes, diffusion and interaction of light with objects of animate and inanimate nature, nuclear facilities, ensuring nuclear and radiation safety, security of nuclear materials and physical protection of nuclear facilities, control systems and automated control of nuclear facilities.

Objects of the professional activity

Thermal and nuclear power plants (NPPs), small nuclear power reactors, combined-cycle and gas-turbine facilities, fuel elements, hydrogen-related facilities, heat and mass transfer devices for different purposes, nuclear reactors and installations, nuclear materials and systems to ensure their security, automated control systems of nuclear-physical installations, radiation technology, mathematical models for theoretical and experimental studies of phenomena and laws in the field of atomic physics, nuclear reactors, diffusion and interaction of radiation with objects of animate and inanimate nature, environmental monitoring, coolants and working bodies of energy and heat-technology installations, materials of nuclear reactors, electronic systems of nuclear and physical installations, development and application of devices and installations for the analysis of substances, radiation effects of ionizing radiation on humans and the environment, mathematical models for simulation of neutron-physical processes occurring in the cores of nuclear reactors, mathematical models to assess proliferation protection of fissile materials. Nuclear technologies of the new generation on the basis of fast-neutron reactors (BN, BREST) with closed nuclear fuel cycle for NPPs that ensure the country's needs for energy and more efficient use of natural uranium and spent nuclear fuel.

Brief description of the curriculum

The program includes the following special courses: "Nuclear power installations, including design, operation and decommissioning", "Nuclear technology and fuel cycle ecology", "Neutron-effective cross-sections and presentation of data to form libraries of group constants".

Scientific-research activity has an essential role in the learning process. PhD students acquire skills in research and analysis of scientific and technical information on the subject of research, modeling processes and objects on the basis

of standard packages, performing experiments and development of methods of research, description of ongoing research and results analysis; development of process models.

The focus is on teaching how to prepare survey, report, publication, patent, and implement research results.

PhD students have scientific practice, perform research work and prepare the final qualifying work in the following organizations: the organizations of the State Corporation "Rosatom"; National Research Centre "Kurchatov Institute".

The base of industrial and/or scientific practice and employment.

Organizations of the State Corporation "Rosatom", National Research Centre "Kurchatov Institute".

Specializations within this programme