

# Physics and thermal Physics of Nuclear Power Installations

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**

Programme webpage at the university website:

[http://eis.mephi.ru/AccGateway/index.aspx?report\\_url=/Accreditation/program\\_annotation&report\\_param\\_pid=87](http://eis.mephi.ru/AccGateway/index.aspx?report_url=/Accreditation/program_annotation&report_param_pid=87)

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**Continuous training program:** Bachelor (Research) -> Master's degree (academic) -> [graduate school] -> scientific and design organizations industry.

**The program's objectives:** training with the fundamental physical and mathematical and engineering preparation, knowledge of the basics of neutron-physical and thermal processes occurring in nuclear power plants for use in research institutes State Corporation "Rosatom" and the Russian Academy of Sciences, the concern "Rosenergoatom".

**Dates of training with full-time education:** on the basis of secondary (full) general education - 4 years

**The area of professional activity:** Research and design of advanced types of nuclear power plants (NPP), including fusion, thermal studies of promising fuel rods, fuel, construction materials and heat transfer fluids. Development of models and software systems for the calculation of thermal-hydraulic and neutron-physical processes in active areas of advanced nuclear reactors. Creation and use of plants and systems for thermal, nuclear physics research, non-equilibrium physical processes, distribution and interaction of light with objects animate and inanimate nature, ensuring nuclear and radiation safety.

**Objects of professional activity:** Nuclear reactors, NPP, thermal-hydraulic and neutron-physical processes in the active zones of nuclear reactors, thermal measurement and control, heat transfer fluids, materials, nuclear reactors, nuclear fuel cycle, system security, system management nuclear physics installations, software systems to study phenomena in the area of Thermal Physics and energy laws, and nuclear fusion reactors, distribution and interaction of light with objects animate and inanimate nature, environmental monitoring, ensuring the security of nuclear materials, facilities, and the nuclear industry and NPP

**Types of professional activity:** research; engineering; production and technology; organizational and managerial.

Graduates will work in research institutions, State Corporation "Rosatom" and the Russian Academy of Sciences, the concern "Rosenergoatom".

**Programs for which it is planned training:** "Training for research centers," "Nuclear power technologies of new generation for the period 2010 - 2020", "Rosatom Innovative Development Program", "National Technological Base" and others.

**Curriculum:** The main feature of the educational process of preparation is the fundamental physical and mathematical and engineering preparation, which allows you to master the main basic and special disciplines:

The research work of students is carried out in close connection with the work carried out at the department and research organizations State Corporation "Rosatom" and the Russian Academy of Sciences.

**Basic and special disciplines:** Experimental reactor physics. Neutron transport theory. Physics of nuclear reactors.

The theory of nuclear reactors. Engineering Thermodynamics. Power generating equipment. Hydrodynamics of NPP. The theory of heat and mass transfer. Engineering calculations for NPP. Dynamics and safety of NPP. Thermal measurements.

### **Practice:**

1. Research and Production (from 6 July to 19 July, 3rd year)
2. Research (distributed: in the framework of NIRS in the 4 th year)

The list of enterprises for practical training:

IPPE, OKB "GIDROPRESS", NIKIET, NRC "Kurchatov Institute", Concern "Rosenregoom", VNIINM Bochvar, RAS institutes, and others.

### **Specializations within this programme**