

# Nuclear reactors (design and fabrication of nuclear fuel elements and assemblies)

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: **80 860- 113 500 rubles per semester**

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The aim of the program is academic training of high-level specialists in the area of technologies of design and fabrication of nuclear fuel elements and assemblies and provision of safety of nuclear reactors.

The educational goals of higher professional education to be realized with the aid of the Specialist's educational program "Design and fabrication of nuclear fuel elements and assemblies" concern

- education in the area of economics, mathematics, social and natural sciences;
- training universal competence in management of complex system engineering projects as well as provide sustainable knowledge of neutron and hydraulic processes of nuclear reactors;
- personal and group development of communication, conflict management, self-management, group communication management, methods of foresight, project and engineering thinking.

The graduates of the program obtain advanced scientific and technical knowledge in the area of nuclear technologies, methods and techniques of non-destructive testing of nuclear elements and facilities, design and fabrication of nuclear fuel elements and assemblies.

Professional area of graduates of the Specialist's program concerns:

- Research, analysis, design and development of information measuring systems of nuclear power plants;
- Technologies of safety analysis of nuclear reactors, radioactive waste treatment, closing fuel cycle and perspective methods of transformation of thermal energy to electric one;
- Technologies of design and fabrication of nuclear fuel elements and assemblies;
- Program models of thermal, hydraulic, neutron physical calculation of processes in active zone of nuclear reactor;
- Information measuring system for mechanical, thermal, neutron physical analysis of interaction of radiation with live and non-live matter;
- Design of systems of safety control in the nuclear industry.

The Specialist's degree course scheme includes such specific units as:

- Dynamics and safety of nuclear reactors;
- Basics of providing safety and reliability of nuclear reactors;
- Design of nuclear fuel elements and assemblies;
- Materials of operating and perspective nuclear reactors;
- Design of nuclear facilities;
- Nuclear technologies and safety of the fuel cycle.

The student has a possibility to take practice in obtained skills in a number of nuclear fuel fabrication enterprises and scientific and design-engineering assets of Russian nuclear industry: OJSC "VNIINM im. A.A. Bochvara", OJSC "Mashinostroitelny zavod", National Research Centre (NRC "Kurchatov Institute"), JSC (Joint Stock Company) "NIKIET", JSC "VNIIT", OKB "GIDROPRESS", Russian Federal Nuclear Center VNIIEF, Russian Federal Nuclear Center VNIITF, S.P. Korolev Rocket and Space Corporation «ENERGIA», FSUE VO "Safety".

## **Specializations within this programme**

### **Nuclear reactors and materials**

Objects of professional activity of graduates of the Specialist's program are:

- Nuclear reactors and nuclear power plants;
- Atomic nucleus;
- Thermal hydraulic and neutron physical processes in nuclear reactors active zones;
- Methods of energy transformation;
- Radiation measurement and control;
- Coolants;
- Nuclear reactor materials;
- Nuclear fuel cycle;
- Safety provision systems;
- Systems of operation of nuclear facilities;
- Programs and mathematical models for theoretical and experimental research of phenomena and mechanisms of nuclear power;
- Nuclear physics;
- Radiation emission and interaction with the objects of live and non-live nature;
- Environment ecological monitoring;
- Provision of safety of nuclear materials and objects of nuclear power.