

Physics and technology of condensed matter and nanosystems

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=71

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Field of study: "Nuclear Physics and Technology".

Duration of training: 4 years, 240 credits.

Course delivery language: russian & english.

Basic department: Condensed Matter Physics (No. 67).

The program of continuous training: Bachelor's Degree – Master of Science – Post Graduate.

Brief description of the program: The purpose of the "Condensed Matter Physics" program is the training of personnel for scientific and industrial organizations, where researchers with fundamental physical, mathematical, experimental, and technological education in condensed matter physics are needed.

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

The main areas of the professional activity of future graduates are the scientific, engineering, and R&D activities.

Graduates are currently required in a variety of businesses and research organizations of the Rosatom State Corporation, federal nuclear centers, the Russian Academy of Sciences, etc. For example: National Research Centre "Kurchatov Institute", Russian Federal Nuclear Center – All-Russia Research Institute of Experimental Physics (Sarov), Dukhov All-Russia Research Institute of Automatics, Center for Photochemical Sciences and Institute of Physics and Technology of the Russian Academy of Sciences, Scientific and Engineering Centre for Nuclear and Radiation Safety, etc.

Programs for which personnel training is planned are "Personnel Training for Russian Scientific Centers", "Training of Personnel for the Federal Nuclear Centers", "Program of Innovative Development of State Corporation Rosatom", etc.

Brief description of the curriculum.

The curriculum consists of two stages:

- basic training, which is unified for the faculty of Experimental and Theoretical Physics, in the humanities, natural sciences, and general professional disciplines within two years;
- the main series of special disciplines (the 3rd and 4th courses): "Theory of Field", "Quantum Mechanics", "Statistical Physics", "Electrodynamics of Continuous Media", "Theoretical Solid State Physics", "Physics of Semiconductors", "Numerical Methods and Mathematical Modeling", "Equations of Mathematical Physics", etc.

In addition to the main special subjects, special courses are taught in 4th year of the undergraduate (and, thereafter, Master's Degree) school by specialized authors on several fronts, deepening knowledge in the field of relevant research: "Introduction into Modern Nanotechnology", "Experimental Methods of Condensed Matter Physics", "Physics of Nanosystems", "Fundamentals of Measurement in Solid State Nanoelectronics", etc.

The attractive features of the program: the relevance of disciplines and the high level of experiments and technology (academic subjects are taught by acting scholars), the opportunity for graduates to work in areas that are widely sought now and are the key areas for the application of science and technology: physics and technology of semiconductor electronic and optoelectronic devices (LEDs, photovoltaic elements, thin-film field-effect transistors, memory elements, etc.), based on nanoscale multilayer semiconductor and dielectric structures.

Practices.

- Physical practicum (lab educational practice, held in semesters 1-5).
- Research work of students (modern physics experiment) is held in semesters 7-8.
- Pre-diploma practice (held for 6 weeks, from May 18 to June 28 for the 4th-year bachelors).

The list of institutions for practice: National Research Centre "Kurchatov Institute", Russian Federal Nuclear Center – All-Russia Research Institute of Experimental Physics (Sarov), Ioffe Physico-Technical Institute of the Russian Academy of Sciences, etc.

Specializations within this programme

The objects of professional activity of graduates are experimental studies, technologies for preparation and modeling of solid-state (semiconductor) nano-scale multilayer structures (nanoheterostructures).