

# Physics of Charged Particle Beams and Accelerating Technics

National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)

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

Language of study: **Russian**

Mode of study: **full-time**

Duration: **2 years**

Availability of free education: **yes**

Price: **196 820 rubles per semester**

Programme webpage at the university website:

[http://eis.mephi.ru/AccGateway/index.aspx?report\\_url=/Accreditation/program\\_annotation&report\\_param\\_pid=88](http://eis.mephi.ru/AccGateway/index.aspx?report_url=/Accreditation/program_annotation&report_param_pid=88)

Programme curator: **Valentina V. Dmitrieva**

Tel.: **Contact name: Olga N. Petukhova, Phone number. +74957885699, ext. 8045.**

E-mail: [ONPetukhova@mephi.ru](mailto:ONPetukhova@mephi.ru)

The course aim is to raise the qualification of specialists and bachelors to the master's degree. It could follow the graduation immediately or after several years of practical work on accelerating facilities, operation, or charged particle beams physics study. Qualified masters are demandable at all leading Russian and international scientific and research centers: National Research Centre "Kurchatov Institute" (Moscow, <http://www.nrcki.ru/e/engl.html> ), Russian Federal Nuclear Center – All-Russia Research Institute of Experimental Physics (Sarov, <http://www.vniief.ru/wps/wcm/connect/vniief/siteeng/> ), Large Hadron Collider collaboration (CERN, Geneva, <http://home.web.cern.ch/> ), FAIR – Russia Research Center and Helmholtz Association (Germany) .

Along with theory study, lectures, and seminars, comprehensive practical trainings at MEPhI laboratories and facilities at collaborating research and educational centers are parts of the educational plan. Substantive education and scientific research activities are important course components.

Graduated masters have overall knowledge of particle accelerators, nuclear and physical facilities, electronic and automated control systems, medical radiation technologies, mathematical simulation models for theoretical and experimental research of different charged particle physics aspects, environmental and ecological monitoring, and safety of nuclear materials, facilities and installations used in atomic industry and power engineering.

Bachelors and specialists graduated on "Nuclear Physics and Technology" could apply to this course. Applicants with practical work background especially in this field core organizations have an advantage.

Basic professional training and educational program comprises the following special topics:

- electrophysical facilities and technologies;
- microwave technics, microwave electronics and engineering;
- vacuum technics and physical electronics;
- electronics of electrophysical facilities;
- information technologies of electrophysical facilities.

Additional or optional subjects are also proposed for study, namely:

- radio frequency instrument design;
- electrophysical facility magnetic systems;
- electromagnetic interference;
- intense electron beams;
- charged particle beam conveying and distribution;
- electromagnetic wave slow-down systems.

Part of the curriculum is also implemented in English.

These additional subjects are to be chosen by a student according to his preferences or by his future employment features.

Scientific and facility-dedicated practice is hosted by leading Russian institutions; Rosatom subsidiaries [e.g., National Research Centre "Kurchatov Institute" and Russian Federal Nuclear Center – All-Russia Research Institute of Experimental Physics (Sarov)], and international collaborations between domestic and foreign research centers [e.g., Large Hadron Collider collaboration coordinated by CERN and FAIR Russia Research Centre and Helmholtz Association (Germany)]. Educational course supervisor and director: A. N. Didenko, corresponding member of the Russian Academy of Sciences, Dr. Phys.-Math Sc., Head of Department.

## **Specializations within this programme**

### **Nuclear physics and technologies**

Professional skills and specialization areas: modern electronics, nuclear and electrophysical facilities electronic systems, automated control systems for nuclear reactors and nuclear physical facilities, ionizing radiation effect on human, environment and control electronics, mathematical modelling of radiation propagation and interaction with matter study, environmental and ecological surveillance, nuclear materials, facilities and installations safety.