**Abstract** оf the program “Nanoelectronics, spintronics and photonics”

**Direction:** 11.03.04 Electronics and nanoelectronics

**Required duration:** 4 years

**Eligibility requirements:** High school certificate or equivalent

**Qualification awarded upon graduation:** Bachelor

**Graduating Institution**: Institute of nanotechnologies in nanoelectronics, spintronics and photonics (INTEL), Department of condensed matter physics

**Purpose of the program:** Preparation of bachelors for scientific and industrial organizations, where researchers are required with a fundamental physical-mathematical and experimental-technological education in the field of devices for micro- and nano-electronics, nano-heterostructures, as well as for further study at the Master program.

**The area of professional activity:** Tools, methods and means of the theoretical and experimental research, mathematical and computer modeling, design, construction, production technology, application and operation of materials, components, electronic devices for solid-state, microwave, optical, micro- and nanoelectronics of various functional purposes; an application of innovative technical solutions for use in modern and prospective analogue, pulse and digital electronic systems and installations; an estimation of economic efficiency of design-and construction decisions, maintenance of a necessary level of unification and standardization.

**Objects of professional activity:** materials, components, electronic devices, installations, methods for their research, design and construction, technological production processes, diagnostic and technological equipment, mathematical models, algorithms for solving typical problems, modern software and information support for modeling and design of electronics and nanoelectronics.

**The academic plan** include two general steps:

1. Basic training in humanitarian, natural sciences and general professional disciplines. Basic courses: General Physics, Mathematical analysis,Linear Algebra, Theoretical Mechanics, The Classical Theory of Fields, Quantum Mechanics, Statistical Physics, Mathematical Physics, Life safety, Sociology, Low, Information Security.
2. Professional training. Basic courses: Solid State Electronics, Languages and programming methods, Physics of semiconductors, Introduction to modern nanotechnologies, Microprocessor systems, Basics of Spintronics, Materials science in micro and nanoelectronics, Digital devices and systems, Electronics (analog and digital electronics), VLSI Technology, Radio and microwave electronics,

**Organizations for the practice and employment of graduates**: The Institution of Functional Nuclear Electronics NRNU MEPhI, scientific centers and industrial companies, Institutions of the Academy of Sciences.