**Abstract program**

**15.03.06 Mechatronics and Robotics**

**Program Name:** Mechatronic systems computer-aided manufacturing

**The program's objectives:** mastery of competencies for the creation of intelligent machines and motion systems with qualitatively new features and properties. It is the principal novelty of mechatronic systems is rapidly growing interest in mechatronics worldwide.

**Training terms:** at full-time tuition – 4 years.

**Graduate Departments:** department of the chair "Technology of mechanical engineering" of NTI NRNU MEPhI.

**Area of professional activity:** design, research, production and operation the mechatronics and robotic systems for application in the automated production, in defensive branch, the Ministry of Internal Affairs of the Russian Federation, the Ministry of the Russian Federation for civil defense, to emergency situations and natural disaster response, on transport, in agriculture, in medicine and in other areas. Area of professional activity of bachelors in the direction of preparation 15.03.06 Mechatronics and a robotics include mechatronics and a robotics.

**Mechatronics** - the area of science and technology, based on a system combining precision mechanics assemblies, sensors, state of the environment and the object, power sources, actuators, amplifiers, computing devices (computers and microprocessors). Mechatronic system - a single set of electro-mechanical, electro-hydraulic, electronic items and computers between which the permanent dynamically changing the exchange of energy and information, a combined total of automatic control system, which has elements of artificial intelligence.

**Robotics** - a field of science and technology, focused on the creation of robots and robotic systems, built on the basis of mechatronic modules (sensory information, execution and management). Robots and robotic systems are designed to perform job operations from micro to macro dimensions, including the human replacement for heavy, exhausting and dangerous work.

**Training is planned** mainly for the innovative development program SC "Rosatom" and the program "National Technological Base".

**Objects of professional activity:** mechatronic and robotic systems, including information and sensor, actuators and control modules, their mathematical, algorithmic and software, methods and tools for their design, simulation, experimental study, debugging and operation, research and production testing of mechatronic and robotic systems having various applications.

**Features of the curriculum:** the professional cycle disciplines form the knowledge and skills of graduates in the field of creating objects on mechatronic principles. Basic disciplines: engineering and computer graphics; electrical and electronics; automatic control theory; details of mechatronic modules, robots, and their design; electrical and hydraulic actuators of mechatronic and robotic devices; basics of mechanical engineering and instrument making, etc.

The curriculum provides three kinds of practices: training (1st and 2nd course - 4 weeks); Production (3 course - 3 weeks), undergraduate (4 year).

**Bases practices** for students are the structural units of enterprises and organizations related to the engineering, instrument engineering, metallurgy (JSC Ural Electrochemical Integrated Plant, LLC "Uralpribor", LLC "Ural Plant of gas centrifuges", LLC "NNKTS" - Novouralsk, JSC RPK "Uralvagonzavod" JSC NTMK), JSC "Ural electromechanical plant" Ekaterinburg).