Mathematical and software tools for computers, computer systems and computer networks (Methods, models, algorithms and software for big data processing)

National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)

Degree or qualification is awarded: **Researcher. Lecturer-researcher**

Language of study: **Russian, English**
Mode of study: **full-time**
Duration: **4 years**
Availability of free education: **yes**
Price: **325 000 rubles per year**

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Basic department: Computing Systems and Technologies (№ 12)

Goals of the Program

The aims of the Program as to training are as follows:

- to give graduates basic knowledge in humanities, and social, economic, mathematical and natural sciences;
- to prepare postgraduates to work successfully in the sphere of activities associated with the operation of computing machines, suites, computer networks, creation of elements and devices of computing tools based on new physical and technical concepts, methods of processing and accumulation of information, algorithms, programs, programming languages and human-machine interfaces, the development of new mathematical methods and tools to support mental processing, development of information and automated design and control systems applied to different subject areas, effective use of computing tools in general, the development of high-tech software and other fields of applied mathematics and computer science, and to have universal and subject-specialized competencies, which would contribute to his/her social mobility and stability in the labor market.

The aims of the Program as to education of the person are as follows: formation of social and personal qualities of the graduates, such as determination, self-discipline, diligence, social skills, team spirit, responsibility for the final result of one's own professional activities, civic consciousness, tolerance; improvement of common culture.

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

The area of professional activities of post-graduates according to the Program includes postgraduate spheres of science, technology and pedagogy, encompassing a set of tasks major in Computer Science and Engineering, including the development of the theory, design, implementation and operation of advanced computer systems, networks and suites, mathware and software.

Objects of the professional activity

The objects of professional activities of graduates, who have mastered the Program, is the chosen area of scientific knowledge, as well as scientific missions of an interdisciplinary nature, containing:

- computer systems and computer networks;
- software and automated systems (programs, program complexes and systems);
- mathematical, informational, technical, linguistic, software, ergonomic, organizational and legal coverage of automated information, computing, designing and control systems;
- high-performance computing and supercomputer equipment;
- design techniques of technical computer equipment and software;

- data structures, databases and knowledge databases, databases and knowledge database management systems.

Brief description of the curriculum

The Program develops competence in area of high performance computations, including hybrid supercomputers technologies, also it provides access to researches in software development techniques, algorithm analysis, programming languages, operating systems, databases and knowledge bases, human-computer interfaces, software tools that expanding intelligent abilities of computer systems, research and development in complex software systems, techniques and tools for automation of development processes, quality assurance, standardization and maintenance. Scientific, theoretical and society values of the program are in increasing efficiency of data and knowledge processing in computer systems and networks and its developing time reduction. Substantial part of the program is devoted to the training of competitive staff for information technology industries according to trends in globalization of the information space.

The base of industrial and/or scientific practice and employment

State Atomic Energy Corporation "Rosatom", Joint Stock Company "Almaz – Antey" Air and Space Defence Corporation", Systemprom Concern, PLC "MCST"

Specializations within this programme