GENERAL CHARACTERISTICS
programs for the training of scientific and scientific-pedagogical personnel in graduate school (postgraduate program)

Федеральное государственное автономное образовательное учреждение высшего образования «Российский университет дружбы народов»

ИНЖЕНЕРНАЯ АКАДЕМИЯ

(наименование основного учебного подразделения (ОУП) – разработчика программы)

Утверждена на заседании УС
инженерной академии,
протокол №2022-08/22-04/2
от «19» 04 20 22 г.

ПРОГРАММА ПОДГОТОВКИ НАУЧНЫХ И НАУЧНО-ПЕДАГОГИЧЕСКИХ КАДРОВ В АСПИРАНТУРЕ

Научная специальность:

1.1.7. Теоретическая механика, динамика машин

(код и наименование научной специальности)

Направленность (профиль):

Theoretical mechanics, machine dynamics

(наименование программы подготовки научных и научно-педагогических кадров)

Программа подготовки научных и научно-педагогических кадров в аспирантуре разработана в соответствии с требованиями:
СУТ РУДН, утвержденных приказом ректора № 139 от «09» марта 2022 г.

Срок освоения программы подготовки научных и научно-педагогических кадров в аспирантуре:

4 года

(очная форма обучения)

Сведения об особенностях реализации программы: программа на английском языке

СОГЛАСОВАНО:

Руководитель программы

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Директор инженерной академии
Разумный Ю.Н.

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Начальник УПКВК
Сафир Р.Е.

(подпись)

2022 г.

1. PURPOSE OF THE POSTGRADUATE PROGRAM

The purpose of postgraduate studies is to guide the postgraduate student to the development of an academic career, maximum adaptation in the scientific environment. The goal is to solve the problems of building a nationally oriented economy and the formation of the necessary quality of "human capital".

The goal is to prepare and defend a dissertation for the degree of candidate of sciences.

2. BRIEF SUMMARY OF THE PROGRAM

The program is focused on the training of highly qualified specialists in the direction of training 1.1.7. "Theoretical Mechanics, Dynamics of Machines". The curriculum is designed in such a way that it allows students to form professional competencies that are currently in demand. The purpose of the program is to create conditions for acquiring the necessary level of knowledge, skills, experience and experience for the implementation of professional activities and preparing for the defense of a scientific qualification work (dissertation) for the degree of candidate of sciences, as well as conducting scientific research in the interests of the development of science, mankind and humanitarian values. Research activities within the framework of the educational program cover the field of science and technology, which studies the behavior of technical objects for various purposes, the laws of mechanical phenomena and related processes of a different nature (pneumohydraulic, thermal, electrical, etc.) using the methods of mechanics and computational mathematics. place in machines, devices, structures and their elements, as well as in materials, both natural and artificially obtained.

The educational program has an intersectoral character, since the problems of strength, stability, durability, rational optimization, resource, survivability, reliability and safety of machine and structure structures are important in most high-tech industries: traditional and nuclear energy, aircraft engineering, rocket science, mechanical engineering, instrumentation, traditional and pipeline transport, industrial, civil and special construction.

In the process of studying, postgraduate students receive theoretical and practical training and skills in research and scientific and pedagogical work, which allow them to work effectively after completing the study of the educational program in enterprises of various fields and industries in senior positions, as well as in research and educational organizations.

3. THE NEED OF THE LABOR MARKET FOR GRADUATES WHO HAVE COMPLETED THE POSTGRADUATE PROGRAM

Graduates who have mastered this program are focused on work in Russian and international companies, enterprises, educational institutions, research organizations in various fields of industry related to the research and design of automatic control systems. State and commercial structures of science-intensive industries are interested in graduates, in particular, enterprises of the aerospace, oil and gas, machine-building and other leading

industries, as well as for the development of an element base used in the digitalization of various sectors of the economy.

Graduates prepared by the program can engage in research activities in the field of the functioning of computers, complexes, computer networks, the creation of elements and devices of computer technology on new physical and technical principles, methods of processing and accumulating information, algorithms, programs, programming languages and human-machine interfaces , the development of new mathematical methods and means of support for intelligent data processing, the development of information and automated design and management systems in application to various subject areas, as well as teaching activities for educational programs of higher education

In the professional sphere, the main consumers of the educational program are such enterprises in Moscow and Russia as:

- Federal State Budgetary Institution of Science Institute of Management Problems. V. A. Trapeznikov of the Russian Academy of Sciences (IPU RAS);

- Computing Center. A.A. Dorodnitsyn of the Russian Academy of Sciences of the Federal Research Center "Informatics and Management" of the Russian Academy of Sciences (CC RAS);

- Federal State Unitary Enterprise "Central Scientific Research Institute of Mechanical Engineering" (FSUE TsNIIMash, Korolev);

- JSC Russian Space Systems;

- Rocket and Space Corporation named after S.P. Korolev (RSC Energia, Korolev);

- FSUE "State Research Institute of Aviation Systems" (GosNIIAS);

- Federal State Autonomous Educational Institution of Higher Education "Peoples' Friendship University of Russia";

- Federal State Budgetary Educational Institution of Higher Education "Bauman Moscow State Technical University (National Research University)"(BMSTU);

- Moscow Aviation Institute (National Research University) (MAI), etc.
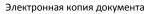
4. REQUIREMENTS FOR THE ENTRANT

For admission to the program, the Admission Rules apply, approved by the relevant local regulatory act and posted in the public domain on the official website of the RUDN University.

5. STRUCTURE AND SCOPE OF THE PROGRAM FOR TRAINING SCIENTIFIC AND SCIENTIFIC-PEDAGOGICAL PERSONNEL IN POSTGRADUATE STUDIES

The structure and volume of the postgraduate program - the period of development is 4 years in full-time.

No	Structure of the Postgraduate Program	The scope of the PhD program in z.e.
1. Scientific component		210

1.1.	Scientific activity aimed at preparing a dissertation for defense	178
1.2.	reparation of publications and (or) applications for patents for inventions, utility models, industrial designs, selection achievements, certificates of state registration of programs for electronic computers, databases, topologies of integrated circuits provided for in paragraph four of clause 5 of federal state requirements	24
1.3.	Intermediate certification by stages of scientific research	8
2. Educational component		24
2.1.	Disciplines (modules)	13
2.2.	Practices, including teaching practice	5
2.3.	Intermediate certification in disciplines (modules) and practice, including pedagogical	6
3. Final certification		6
Scope of the Postgraduate Program		240

6. CHARACTERISTICS OF THE PROFESSIONAL ACTIVITY OF THE GRADUATE OF THE EDUCATIONAL PROGRAM

6.1 Professional area:

The area of professional activity of graduates who have mastered the postgraduate program includes the spheres of science, technology, technology and pedagogy, covering the totality of tasks of the Informatics and Computer Science direction, including the development of theory, the creation, implementation and operation of elements of computer technology, computer and information technology in the field of aerospace , oil and gas, machine-building industry.

The areas of activity of the profile "Elements and devices of computer technology and control systems" include the development of: models for describing and evaluating the effectiveness of solving control problems and decision making in technical systems; special algorithmic, mathematical and software support for control systems and decision-making mechanisms in technical systems; methods of parametric and signal identification of automatic control systems; methods and algorithms for the design of expert and intelligent systems, decision-making methods in technical systems under conditions of uncertainty, etc.

6.2 Objects of professional activity:

The objects of professional activity of graduates who have mastered the postgraduate program are the chosen area of scientific knowledge, as well as scientific tasks of an interdisciplinary nature, containing:

- computers, complexes, systems and networks;
- software for computer equipment and automated systems (programs, software complexes and systems);
- mathematical, informational, technical, software for automated information, computing, design and control systems;
- technologies for the development of computer hardware and software products.

The selected area of scientific knowledge is the Elements and devices of computer technology and control systems, which includes:

- areas of scientific knowledge and scientific tasks of an interdisciplinary nature related to the development of theory, creation, implementation and operation of elements of computer technology, computer and information technology, these are areas related to the creation and use of aviation and space systems, science-intensive projects in the fields of oil and gas, machine-building, energy industry, high-performance computing and the use of supercomputer technology, software development for computer technology, automated and intelligent systems .:

- automated information, computing and control systems;
- high-performance computing and the use of supercomputer

technology, including big data processing technologies, software development for computer technology, automated and intelligent systems.

The postgraduate program is aimed at mastering all types of professional activities for which the graduate is preparing.

6.3. Types of professional activities of the graduate

Within the framework of this direction of training, a graduate student prepares for research activities in universities, research and production enterprises of any form of ownership, as well as for teaching at a university.

The types of professional activities for which graduates who have mastered the postgraduate program are preparing:

- research activities in the field of the functioning of computers, complexes, computer networks, the creation of elements and devices of computing technology based on new physical and technical principles, methods of processing and accumulating information, algorithms, programs, programming languages and human-machine interfaces, the development of new mathematical methods and means of support for intelligent data processing, development of information and automated design and management systems in application to various subject areas;

- teaching activities in educational programs of higher education.

6.4. The tasks of the professional activity of the graduate

A graduate who has mastered the postgraduate program, in accordance with the types of professional activities that the educational program is focused on, is ready to solve the following professional tasks:

The tasks of the professional activity of a graduate student are:

- independent (including leading) research activities, requiring broad fundamental training in modern areas of technical systems management, design of intelligent and information-control systems, deep specialized training in the chosen direction, possession of skills in modern research methods;

- scientific and pedagogical work in higher and secondary specialized educational institutions.

7. LOCATION OF THE STUDY PROGRAM

7.1. The postgraduate program is implemented by the Russian University of Peoples' Friendship.

7.2. Information about the planned bases for conducting practices and (or) performing scientific research

Practice and research*	Base of practice *(name of organization, location)*
Pedagogical practice (stationary)	RUDN University, Moscow

8. FEATURES OF THE IMPLEMENTATION OF THE POSTGRADUATE PROGRAM

8.1. The program is implemented without the use of a network form, without the use of distance learning technologies, with the use of e-learning elements using the TUIS RUDN University system.

8.2. The language of the PhD program is Russian.

8.3. The program does not provide for the training of people with disabilities and people with disabilities.