Federal State Autonomous Educational Institution of Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA
NAMED AFTER PATRICE LUMUMBA
RUDN University

Academy Of Engineering
(educational division (faculty/institute/academy) as programme developer)

Base department "Machine-building technologies"
(department realizing the PhD program)

SCIENTIFIC RESEARCH PLAN

Scientific specialty:
2.5.6. Mechanical Engineering Technology
(scientific speciality code and title)

The course instruction is implemented within the PhD programmes:
Mechanical Engineering Technology
(PhD program title)

2026 г.

1. DISIPLINE (MODULE) GOAL

The goal of conducting scientific research (scientific (research) activity) is to prepare a dissertation for the degree of Candidate of Sciences (hereinafter referred to as the dissertation) for defense.

- List of planned results based on the outcomes of scientific research;
- Scope of scientific research;
- Tentative plan for conducting scientific research;
- Plan for preparing the dissertation and publications in which the main scientific results of the dissertation are presented;
- List of stages for mastering the scientific component of the postgraduate program, distribution of these stages and final certification of postgraduate students.

2. REQUIREMENTS FOR LEARNING OUTCOMES

The result of scientific research is the solution of a scientific problem that is important for the development of the relevant branch of science, or the development of a new scientifically based technical, technological or other solution that is essential for the development of the country.

Preparation of a dissertation for defense includes the implementation of an individual scientific activity plan, writing, registration and presentation of a dissertation for final certification.

The scientific activity plan includes an approximate plan for the implementation of scientific research, a plan for the preparation of a dissertation and publications that outline the main scientific results of the dissertation, as well as a list of stages of mastering the scientific component of the postgraduate program, the distribution of these stages and the final certification of graduate students.

The plan of scientific activity of a particular student is approved in the individual plan of scientific activity of a graduate student, the requirements for which are established by the relevant local regulatory act of the RUDN University.

3. WORKLOAD OF THE DISCIPLINE AND TYPES OF ACTIVITIES

The overall workload of the scientific research is 210 credits (7560 academic hours).

4. RESEARCH CONTENTS

Stage name	**Stage content (topics, activities)**	Labor **intensity,** acc.h.
1 course		
Section 1. Scientific activity of a postgraduate student aimed at preparing a dissertation for defense	Topic 1. Choice of the topic of dissertation research and approval of the topic of the dissertation.	1152
	Topic 2. Development of the structure and planning of the dissertation work.	
	Topic 3. Preparation of a review on the topic of the dissertation.	
	Topic 4. Compilation of a bibliography on the topic of the dissertation based on stock materials, monographs, scientific collections, domestic and foreign periodicals, as well as Internet resources (at least 150 sources).	
	Organization and conduct of experiments	
	Topic 1. Collection, processing and analysis of scientific and statistical information on the topic of dissertation work on stock and published works.	

Stage name	Stage content (topics, activities)	Labor **intensity,** acc.h.
	Topic 2. Material, methodology and conditions for conducting experiments.	
	Topic 3. Primary documentation of observations and experimental data.	
	Topic 4. Collection of empirical materials (based on the results of observations, experimental data).	
Section 2. Preparation of publications that present the main scientific results of the dissertation	Topic 1. Analysis of domestic and foreign editions of scientific periodicals included in the Scopus database .	108
	Topic 2. The choice of domestic and foreign publications for publication on the topic of the dissertation.	
	Topic 3. Studying the requirements for publications in periodicals of Web databases of science .	
Section 3. Preparation of applications for patents for inventions, utility models, industrial designs, breeding achievements, certificates of state registration of programs, etc.	Topic 1. Studying the rules and methods for preparing applications for patents for inventions, utility models, industrial designs, selection achievements, certificates of state registration of programs, etc.	108
	Topic 2. Selection of suitable research areas for patents, utility models, industrial designs, certificates of state registration of programs on the official websites of the Russian Academy of Sciences, RFBR, etc.	
Intermediate certification		72
	TOTAL:	**1440**
2 course		
Section 1. Scientific activity of a postgraduate student aimed at preparing a dissertation for defense	**Organization and conduct of experiments** Topic 1. Collection, processing and analysis of scientific and statistical information on the topic of dissertation work on stock and published works. Topic 2. Material, methodology and conditions for conducting experiments. Topic 3. Primary documentation of observations and experimental data. Topic 4. Collection of empirical materials (based on the results of observations, experimental data).	1728
	Methods and ways of processing empirical materials Topic 1. Graphic methods of processing materials. Topic 2. Statistical methods of processing materials. Topic 3. Computer models.	

Stage name	Stage content (topics, activities)	Labor **intensity,** acc.h.
	Analysis and interpretation of empirical materials	
	Dissertation preparation: Topic 1. Formulation of defended scientific positions on the topic of the dissertation. Topic 2. Writing dissertation chapters. Topic 3. Drawing up a list of literary sources and making references to them in the dissertation text.	
Section 2. Preparation of publications that present the main scientific results of the dissertation	Topic 1. The choice of domestic and foreign publications for publications on the topic of the dissertation.	108
	Topic 2. Preparation of manuscripts of articles for publication in periodicals of databases.	
	Topic 3. Speech at scientific conferences and meetings on dissertation topics.	
Section 3. Preparation of applications for patents for inventions, utility models, industrial designs, breeding achievements, certificates of state registration of programs, etc.	Topic 1. Review of scientific open and stock sources in the direction of planned developments.	108
	Topic 2. Preparation of hardware required for scientific research.	
	Topic 3. Conducting experimental work.	
	Topic 4. Processing of the received data and clarification of the regularities of the processes established during the experiments.	
	Topic 5. Applying for patents, grants, programs, models, etc. according to completed research.	
Intermediate certification		72
	TOTAL:	**2016**
3 course		
Section 1. Scientific activity of a postgraduate student aimed at preparing a dissertation for defense	**Dissertation preparation:**	1872
	Topic 1. Formulation of defended scientific positions on the topic of the dissertation.	
	Topic 2. Writing dissertation chapters.	
	Topic 3. Drawing up a list of literary sources and making references to them in the dissertation text.	
Section 2. Preparation of publications that present the main scientific results of the dissertation	Topic 1. The choice of domestic and foreign publications for publications on the topic of the dissertation.	108
	Topic 2. Preparation of manuscripts of articles for publication in periodicals of databases.	
	Topic 3. Speech at scientific conferences and meetings on dissertation topics.	
Section 3. Preparation of applications for patents for inventions, utility models, industrial designs, breeding	Topic 1. Review of scientific open and stock sources in the direction of planned developments.	108
	Topic 2. Preparation of hardware required for scientific research.	

Stage name	Stage content (topics, activities)	Labor **intensity,** acc.h.
achievements, certificates of state registration of programs, etc.	Topic 3. Conducting experimental work.	
	Topic 4. Processing of the received data and clarification of the regularities of the processes established during the experiments.	
	Topic 5. Applying for patents, grants, programs, models, etc. according to completed research.	
Intermediate certification		72
	TOTAL:	**2160**
4 course		
Section 1. Scientific activity of a postgraduate student aimed at preparing a dissertation for defense	**Dissertation preparation:**	1656
	Topic 1. Writing dissertation chapters.	
	Topic 2. Drawing up a list of literary sources and making references to them in the dissertation text.	
	Topic 3. Preparation of the dissertation text.	
	Topic 4. Preparation of the text of the abstract.	
	Topic 5. Preparation of a report and preliminary defense of a dissertation.	
	Topic 6. Preparation of documents required for defense at the Academic Dissertation Council.	
	Topic 7. Choosing an opposing scientific organization and providing it with dissertation materials.	
	Topic 8. Choosing scientific opponents and providing them with dissertation materials.	
	Topic 9. Placement of the text of the dissertation in the Internet resources, in accordance with the requirements of the Higher Attestation Commission.	
	Topic 10. Distribution of dissertation abstracts for feedback from scientific organizations and specialists.	
	Topic 11. Preparation of a report for the defense of a dissertation at the Academic Dissertation Council.	
Section 2. Preparation of publications that present the main scientific results of the dissertation	Topic 1. The choice of domestic and foreign publications for publications on the topic of the dissertation.	108
	Topic 2. Preparation of manuscripts of articles for publication in periodicals of databases.	
	Topic 3. Speech at scientific conferences and meetings on dissertation topics.	
Section 3. Preparation of applications for patents for inventions, utility models, industrial designs, breeding achievements, certificates	Topic 1. Review of scientific open and stock sources in the direction of planned developments.	108
	Topic 2. Preparation of hardware required for scientific research.	
	Topic 3. Conducting experimental work.	

Stage name	Stage content (topics, activities)	Labor **intensity,** acc.h.
of state registration of programs, etc.	Topic 4. Processing of the received data and clarification of the regularities of the processes established during the experiments.	
	Topic 5. Applying for patents, grants, programs, models, etc. according to completed research.	
Intermediate certification		36
	TOTAL:	**1944**
	TOTAL:	**7560**

* - the stages of scientific research are FULLY reflected in the review of the student 's supervisor .

5. EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

The place of scientific research shall comply with the current sanitary and epidemiological requirements, fire safety regulations and standards of health protection of the students.

The research plan requires classrooms that meet the safety requirements for academic work, if necessary, a computer room with workstations that provide Internet connection, as well as classrooms with multimedia equipment.

6. INTERNSHIP LOCATION AND TIMELINE

Scientific research can be carried out both in structural subdivisions of RUDN University or in organizations of Moscow (stationary), and at bases located outside of Moscow (exit).

Conducting scientific research on the basis of an external organization (outside RUDN University) is carried out on the basis of an appropriate agreement, which specifies the terms, place and conditions for performing scientific research in the base organization. The deadlines for the implementation of scientific research correspond to the period indicated in the calendar academic schedule of the postgraduate program.

Practice dates can be adjusted in coordination with the Department of Doctoral Studies of the RUDN University

7. EDUCATIONAL-METHODOLOGICAL AND INFORMATION SUPPORT FOR SCIENTIFIC RESEARCH

Regulatory documents regulating the process of preparation and defense of dissertations:

Federal Law of August 23, 1996 No. 127-FZ «On Science and State Scientific and Technical Policy» — URL: http://pravo.gov.ru/proxy/ips/?docbody=&nd=102043112

Decree of the Government of the Russian Federation dated September 24, 2013 No. 842 «On the procedure for awarding academic degrees» — URL: http://pravo.gov.ru/proxy/ips/?docbody=&nd=102167993

GOST R 7.0.11-2011 System of standards for information, library and publishing. Dissertation and dissertation abstract. Structure and design rules.

Internet Resourses:

ELS RUDN University and third party EBS, to which university students have accessbased signed contracts:

- RUDN Electronic Library System, http://lib.rudn.ru/MegaPro/Web ;
- ELS University Library Online, http://www.biblioclub.ru ;
- EBS Urayt, http://www.biblio-online.ru ;
- ELS Student Consultant, http://www.studentlibrary.ru ;
- EBS Lan, http://e.lanbook.com ;
- EBS Trinity Bridge http://www.trmost.ru

Databases and search engines:

- Electronic fund of legal and normative-technical documentation, http://docs.cntd.ru ;
- Yandex search system https:// www .yandex.ru ;
- Google search system https://www.google.com ;

– Reference database Scopus , http://www.elsevierscience.ru/products/scopus
Educational and methodological materials for scientific research:
Guidelines for preparing dissertations and scientific publications.

8. ASSESSMENT TOOLKIT AND GRADING SYSTEM FOR EVALUATION OF PHD STUDENTS' COMPETENCES LEVELS AS SCIENTIFIC RESEARCH RESULTS

Based on the results of the stages of scientific research, the PhD student submits a detailed oral or written report to the supervisor or to a department meeting. The report includes information characterizing the content of the PhD student's work and reflecting the implementation of scientific research.

The report must include information:

– about the degree of readiness of the dissertation;
– on the preparation and publication of articles in journals included in the list of Higher Attestation Commission, Russian Science Citation Index, Scopus, Web of Science and others equated to them and/or approved by the Academic Council of RUDN University;
– on the participation of a PhD student in scientific and technical events on the topic of his research;
– on participation in the research work of the department (with participation);
– other.

During the interim certification period, the supervisor provides feedback on the quality, timeliness and success of the PhD student's stages of scientific activity.

The results of scientific research for every six months of study are determined by conducting an intermediate certification with grades «excellent», «good», «satisfactory», «unsatisfactory» and in the ECTS system (A, B, C, D, E) in accordance with the rating system.

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