The ministry of science and higher education of the Russian Federation

Federal state autonomous educational institution of higher education

«Ural federal university named after the first President of Russia B. N. Yeltsin»

APPROVED

Vice-rector for Research

A. V. Germanenko

2022

ACADEMIC STAFF TRAINING PROGRAM in the DOCTORAL COURSE
(doctoral program)

Description

Technology of organic substances

List of information about the doctoral program	Credentials
Doctoral program Technology of organic substances	**Code DP** 2.6.14
Group of specializations Chemical technologies, material sciences, metallurgy	**Code** 2.6.
Federal state requirements (FSR)	Order of the Ministry of science and higher education of the Russian Federation of 20.10.2021 № 951
Independently approved requirements (IAR)	Order «On the introduction of «Requirements to the development and implementation of academic staff training programs in the UrFU doctoral course» of 31.03.2022 № 315/03

Yekaterinburg

2023

Description of the academic staff training program in the doctoral course (hereinafter referred to as the doctoral program) is compiled by:

#	Full name	Academic degree, academic title	Occupational title	Research unit
1	Zyrianov Grigory Vasil'evich	D.Sc., Professor	Professor	Department of organic and biomolecular chemistry
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Recommended by:

Educational and methodological board of the Institute of chemical engineering

Report № 1 of 10.01.2023

Chairman of the educational and methodological board of the institute A. B. Darintseva

Agreed by:

Head of academic staff training department E. A. Butrina

1. GENERAL PROVISIONS

1.1. The doctoral program description is developed on the basis of independently approved requirements (IAR) and the rector's order «On the introduction of «Requirements to the development and implementation of academic staff training programs in the UrFU doctoral course» of 31.03.2022 #315/03, describes the general requirements for the program results, corresponding to the characteristics of the graduate's future professional activity, as well as the structure and conditions of the doctoral program implementation.

1.2. List of regulations:

- Federal Law of 29.12.2012 # 273-FL «On education in the Russian Federation» (as amended and supplemented);
- Federal Law of 27.07.2006 # 149-FL «On information, information technologies and on information protection» (as amended and supplemented);
- Federal Law of 27.07.2006 # 152-FL «On personal data» (as amended and supplemented);
- Federal Law of 23.08.1996 # 127-FL «On science and state science and technology policy» (as amended and supplemented);
- Resolution of the Government of the Russian Federation of 30.11.2021 # 2122 «On approval of the Regulations on the academic staff training in the doctoral course (military doctoral course)»;
- Order of the Ministry of science and higher education of the Russian Federation of 24.02.2021 №118 «On approval of the nomenclature of scientific specializations with the award of academic degrees, and the amendment to the Regulations on the Thesis committee for the academic degree of Doctor of Philosophy, for the academic degree of Doctor of Sciences, approved by order of the Ministry of education and science of the Russian Federation of 10.11.2017 #1093»;
- Order of the Ministry of science and higher education of the Russian Federation of 20.10.2021 #951 «On approval of federal state requirements to the structure of the academic staff training programs in the doctoral course (military doctoral course), the conditions for their implementation, the completion periods of these programs, based on various forms of training, educational technologies and features of individual categories of doctoral students (adjuncts)»;
- Regulation on awarding academic degrees in the federal autonomous state educational institution of higher education «Ural federal university named after the first President of Russia B.N. Yeltsin» (order of 19.07.2021 #590/03);
- UrFU Charter and other legal, local regulatory acts of the university.

1.3. The doctoral program is coordinated with employers - social partners:

- NP « Union of construction industry enterprises of the Sverdlovsk region»;
- Institute of solid state chemistry UB RAS.

1.4. Form of study and duration of the doctoral program: full-time, 4 years.

1.5. Doctoral program load: 240 credit points.

1.6. Main participants of the doctoral program:

- employers;
- doctoral students;
- teaching staff;
- administration and collective bodies of the university management.

1.7. Requirements for applicants:

Defined by the Admission rules to UrFU.

2. DESCRIPTION OF PROFESSIONAL EXPERTISE OF GRADUATES

The area of graduate professional expertise, types, and objectives of professional expertise in the scientific specialization 05.17.04 - Technology of organic substances, were agreed with representatives of employers - social partners.

2.1. Area of graduate professional expertise

The area of expertise of graduates who have mastered the doctoral program includes:

- physical, physical-chemical, and chemical methods, approaches, and tools in the production of substances and materials, manufacturing of products for various purposes;
- physical and chemical material processing;
- design, implementation, and production operation for basic inorganic substances, construction materials, products of basic and fine organic synthesis, polymer materials, refined petroleum, gas, and solid fuel products, medicines, energy-saturated materials, and products based on them;
- research in institutes of the RAS, research organizations of various levels, and educational institutions of higher education;

The graduate will be able to perform professional activities in enterprises and organizations of all organizational and legal forms for the development, production, and use of organic substances, as well as organizations, carrying out research in the field of organic chemistry and the technology of organic materials.

2.2. Objects of graduate professional expertise

The objects of professional expertise of graduates who have mastered the doctoral program are:

- chemicals and materials;
- methods and instruments for the determination of substances and materials composition and properties;
- equipment, technological processes, and industrial systems for the production of substances, materials, and products, as well as their management and regulation systems;
- software for modeling chemical-technological processes.

2.3. Types and objectives of graduate professional expertise

A graduate student is prepared for the following types and objectives of professional expertise (Table 1).

Table 1. List of types of professional expertise and the corresponding professional objectives

№	Type(s) of professional expertise (TPE)	Professional objectives (PO)
1	Research	- study of scientific and technical information, local and foreign research practices; - mathematical modeling of processes and objects based on standard packages for computer-assisted design and application program packages for scientific research; - conducting experiments according to the assigned methodology, compiling a description of the research and analysis of the results; - preparation of data for compiling reviews, reports, and scientific publications;

		- preparation of a report on the completed task, participation in the implementation of the research and development results; - taking measures on intellectual property protection and research and development results as the commercial secrets of enterprise
2	Production and technological	- organization of workplaces, their technical equipment, and placement of technological equipment; - process control of industrial production; - incoming inspection of raw materials; - control over compliance with technological discipline; - product quality control using standard methods; - development of technological processes in preparation for new products production; - inspection of the technical condition and residual life of the equipment, organization of preventive inspections and maintenance; - acceptance and assimilation of commissioned equipment; - preparation of equipment and spare parts requests, preparation of technical repair documentation
3	Organizational and managerial	-technical writing (work schedules, instructions, plans, estimates, materials and equipment requests, etc.), as well as reporting on approved forms; - standardization and preparation work for certification of technical means, systems, processes, equipment, and materials; - organization of teamwork in operating production conditions; - personnel work and wages fund planning; - preparation of initial data for the selection and justification of scientific, technical, and organizational decisions based on economic analysis; - development of operational working plans for primary production units; - analysis of production units' costs and performance; - planning and implementation of measures to prevent industrial injuries, occupational diseases, and environmental violations

3. STRUCTURE OF THE DOCTORAL PROGRAM

3.1. The structure of the doctoral program includes three components: research and educational components, and final assessment (Table 2).

Table 2. Components of the doctoral program

#	Name of components of the doctoral program and their elements	Assessment form of the doctoral program acquisition
1	***Research component***	
1.1	Research of a doctoral student aimed at the preparation of the thesis for the academic degree of Doctor of Philosophy (hereinafter referred to as the doctoral thesis) by the defense	Midterm assessment based on the fulfillment of the research stages
1.2	Preparation of publications that present the main research results of the doctoral thesis in peer-reviewed scientific journals, equivalent scientific publications indexed in the international databases Web of Science and Scopus, and international databases defined in accordance with the recommendation of the Higher attestation commission under the Ministry of Science and higher education of the Russian Federation, as well as in scientific publications indexed in the scientometric database Russian Science Citation Index (RSCI) and (or) applications for patents for inventions, utility models, industrial designs, selection inventions, certificates of state registration of computer programs, databases, topographies of integrated circuits	
2	***Educational component***	
2.1	Subjects aimed at preparing and passing PhD candidacy examinations: - History and philosophy of science; - Foreign language; - Technology of organic substances	Midterm assessment based on the acquisition of subjects and practice
2.2	Elective subjects: - Scientometrics and modern information and communication technologies in science; - Pedagogy of higher education	
2.3	Optional subjects: - Advanced topics of chemistry, chemical technology, and biotechnology -Methods of teaching chemistry, chemical technology and biotechnology at the university	
2.4	Practice: - research	
3	***Final assessment***	Examination of the doctoral thesis compliance with the requirements of the Federal Law of 23.08.1996 #127-FL «On science and state science and technology policy»

4. CONDITIONS FOR THE DOCTORAL PROGRAM IMPLEMENTATION

The conditions for the doctoral program implementation include system-wide requirements, material and technical and educational and methodological support, staffing and financial conditions for the doctoral program implementation, as well as the applied mechanisms for assessing the quality of the educational activities and preparing students for the doctoral program.

4.1. System-wide conditions for the doctoral program implementation

The University has on the right of ownership or another legal basis the material and technical support for the implementation of both research - has a research potential in the scientific specialization, in which the doctoral program is being implemented, has a research infrastructure that allows to carry out fundamental, exploratory and applied research, and educational activities - in terms of doctoral student mastering subjects, internship, midterm, and final assessment in accordance with the curriculum.

Each doctoral student during the entire study period is provided with individual unlimited access to the electronic information educational environment of the university from any point having access to the information and telecommunication network «Internet» (hereinafter referred to as the «Internet» network), both on and off the university campus.

The electronic information educational environment of the university provides:

- access to curricula, working programs of disciplines, and practices, electronic educational publications and electronic educational resources specified in the working programs of disciplines and practices;
- the building of a student electronic portfolio;
- functioning of the electronic service «Personal account of a doctoral student».

In the case of the doctoral program implementation using distance learning technologies, the electronic information and educational environment additionally provides:

- recording of the educational process, the results of the midterm assessment, and the results of the doctoral program acquisition;
- conducting all types of training sessions, assessment of learning outcomes using e-learning, and distance learning technologies;
- interaction between participants of the educational process, including synchronous and (or) asynchronous interaction through the Internet.

The electronic information educational environment functioning is ensured by appropriate information and communication technologies means and the qualifications of employees using and supporting the electronic information educational environment. The functioning of the electronic information and educational environment complies with the legislation of the Russian Federation.

When implementing the doctoral program in a network form, the requirements for the doctoral program implementation are provided by a set of resources for material, technical and educational support provided by organizations participating in the doctoral program implementation in a network form.

When implementing the doctoral program or part (parts) of the doctoral program at other organizations, departments, or other structural subdivisions created by the university according to the established procedure, the conditions for implementing the doctoral program are provided by a combination of resources of these organizations.

4.2. Logistic and educational and methodological support

The premises are auditoriums and laboratories for carrying out research and conducting classes of all types provided by the doctoral program, with equipment and technical teaching aids, defined in the working programs of subjects (modules), and research.

The premises for doctoral self-study training are equipped with computers having Internet access and provide access to the electronic information educational environment of the university.

The university is provided with the necessary set of licensed software with the content defined in the working programs of subjects, and research and is entitled to annual updates if necessary.

The educational publication provision rate of educational activities is defined based on the calculation of at least one educational publication in print and (or) electronic form, sufficient for the doctoral program acquisition, for each doctoral student in each subject included in the individual working plan.

Doctoral students are provided with access (remote access), including the case of the use of e-learning, and distance learning technologies, to modern course materials, library collections and library and reference systems, professional databases, and information reference systems with the content defined in the working programs of subjects and is entitled to updates (if necessary).

Modes of access to the electronic library system:

Zonal scientific library http://lib.urfu.ru/course/view.php?id=167

UrFU electronic resources http://lib.urfu.ru/mod/data/view.php?id=2802

Library catalogue http://lib.urfu.ru/course/view.php?id=181

SciFinder http://www.scifinder.com

Reaxys http://reaxys.org

ScienceDirect https://www.sciencedirect.com/

Web of Science https://www.webofknowledge.com

4.3. Staffing conditions for the doctoral program implementation

The doctoral program implementation is provided by the academic university staffs, as well as persons involved in the doctoral program implementation on the terms of an independent contractor contract. The qualifications of teaching staffs must meet the qualification requirements specified in the qualification handbooks and (or) professional standards (if applicable).

The qualitative and quantitative composition of teaching staffs participating in the doctoral program implementation and persons involved in the doctoral program implementation on the terms of an independent contractor contract (based on the number of positions to be replaced, reduced to integer values) must meet the following requirements: at least 60% of the number of full-time academic staff participating in the doctoral program implementation must have an academic degree (including an academic degree obtained in a foreign state and recognized in the Russian Federation) and (or) an academic title (including an academic title obtained in a foreign state and recognized in the Russian Federation).

The supervisor of a doctoral student must have an academic degree of Doctor of Sciences, or in some cases, by decision of the University, an academic degree of Doctor of Philosophy, or an academic degree obtained in a foreign state, recognized in the Russian Federation; conduct research or participate in the implementation of such activities in the relevant research area within the framework of a scientific specialization for the last 3 years; have publications based on the results of the specified activities in peer-reviewed local or foreign publications; carry out approbation of the specified activity, including

giving of the presentations on the research subject in Russian and international conferences over the past 3 years.

Requirements for the qualifications of the teaching staff involved in the implementation of the program subjects in English are established in the educational program, taking into account clause 6.3 «Regulations on the assignment of the «English-speaking» status and the implementation of academic staff training programs in doctoral school in English» (Order of 15.10. 2018 #811/03).

The scientific advisor must have an academic degree of Doctor of Philosophy or an academic degree of Doctor of Sciences or a foreign academic degree recognized in the Russian Federation.

4.4. Financial support of the doctoral program

Financial support for the doctoral program implementation should be carried out in an amount not lower than the basic standard costs established by the Ministry of science and higher education of the Russian Federation for the provision of public services in the education sector for a given education level and major, with consideration to adjustment factors that take into account the specifics of educational programs in accordance with the Methodology determining the standard costs for the provision of public services for the implementation of higher education programs in specializations (majors) and enlarged groups of specializations (majors), approved by order of the Ministry of education and science of the Russian Federation of 30.10. 2015 #1272 (registered by the Ministry of Justice of the Russian Federation 30.10.2015, registration #39898).

4.5. Applied mechanisms for quality evaluation of educational activity and doctoral training

The quality of educational activity and training of doctoral students in the doctoral course is defined within the framework of the internal evaluation system, as well as the external evaluation system on a voluntary basis.

Aiming to improve the doctoral program, the university, when conducting a regular internal quality evaluation of the educational activity and preparing the doctoral students, involves employers and their associations, other legal entities, and (or) individuals, including teaching university staffs.

Within the internal quality evaluation system of educational activity and training of the students, doctoral students are provided with the opportunity to assess the conditions, content, organization, and quality of the educational process as a whole and in individual subjects, practice, and research.

The external quality evaluation system of educational activity and training of the doctoral students can be carried out within the professional public accreditation conducted by employers, their associations, as well as authorized organizations including foreign organizations, or authorized national professional public organizations that are part of international structures aiming to recognize the quality and level of proficiency of the graduates who have mastered the doctoral program and meet the requirements of professional standards (if applicable), the requirements of the labor market for specialists of the relevant profile.

5. EVALUATION OF THE RESULTS OF THE DOCTORAL PROGRAM ACQUISITION

The planned results of the doctoral education program acquisition are formed step by step within the disciplines and practices in accordance with the curriculum. Evaluation of the results of mastering the program by a doctoral student is carried out in the form of midterm and final assessments.

A midterm assessment is carried out in the form of PhD qualifying exams, credits for elective and optional subjects, research practice, research activity, and thesis preparation for an academic degree of Doctor of Philosophy. The form and procedure for conducting midterm assessment for PhD qualifying exams are established by the Ministry of science and higher education of the Russian Federation, for other disciplines - by local university regulations.

The final assessment is carried out in the form of the doctoral thesis examination for its compliance with the criteria established in accordance with the Federal Law of 23.08.1996 #127-FL «On science and state science and technology policy», and the requirements for a thesis for an academic degree of Doctor of Philosophy established by the Regulations on the awarding of academic degrees in UrFU.

6. REGISTRATION SHEET OF CHANGES IN THE DOCTORAL PROGRAM

Number of the change sheet	Number of the minutes of the institute educational and methodological board meeting	Date of the institute educational and methodological board meeting	Total Sheets in Document	DP director signature