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MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA
federal state autonomous educational institution of higher education
"St. Petersburg State Electrotechnical University" LETI "named after. IN AND. Ulyanov (Lenin)" (St. Petersburg Electrotechnical University "LETI")

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Vice-Rector for Research
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EDUCATIONAL PROGRAM OF HIGHER EDUCATION - THE PROGRAM OF TRAINING SCIENTIFIC AND SCIENTIFIC AND PEDAGOGICAL STAFF IN POSTGRADUATE STUDIES

Group of scientific specialties: 2.3. "Information Technology and Telecommunications"
2.3.7. "Computer modeling and design automation"

Full-time form of education
Duration of study: 3 years
Faculty: FCST
Graduating Department: CAD

Saint Petersburg
2022

CONTENT

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1. General characteristics of the postgraduate program

1.1. Purpose of the Postgraduate Program

The program for the training of scientific and scientific-pedagogical personnel in postgraduate studies (hereinafter referred to as the postgraduate program), implemented at the Federal State Autonomous Educational Institution of Higher Education "St. IN AND. Ulyanov (Lenin)" (hereinafter - SPbGETU "LETI"), scientific specialty 2.3.7. "Computer modeling and design automation", provided for by the nomenclature of scientific specialties in which academic degrees are awarded, approved by order of the Ministry of Education and Science of Russia dated February 24, 2021 No. 118 (hereinafter referred to as the specialty nomenclature), is a set of regulatory documents,

The postgraduate program regulates the goals, content, conditions, terms, forms and technologies for the implementation of educational activities for training programs for scientific and scientific-pedagogical personnel in postgraduate studies, the planned results of mastering this program and assessing the quality of postgraduate training.

1.2. The purpose of the postgraduate program is to create conditions for postgraduate students to carry out research activities in order to prepare a dissertation, including providing access to information about scientific and scientific and technical results on scientific topics corresponding to the scientific specialty in which the postgraduate program is being implemented, access to scientific and research and experimental base necessary for conducting research activities in the preparation of a dissertation; creation of conditions for preparing a graduate student for the candidate's examinations.

1.3. Persons wishing to study the PhD program must have a higher education (specialist or master's degree). Admission to graduate school is carried out on a competitive basis in accordance with the rules for admission to graduate school of St. Petersburg Electrotechnical University "LETI" approved annually.

1.4. Postgraduate studies are carried out on a full-time basis.

1.5. The term for obtaining education under the postgraduate program is 3 years, regardless of the educational technologies used.

1.6. When training according to an individual curriculum for persons with disabilities, it is possible to extend the period of study by no more than one year in comparison with the period established for the corresponding form of training.

1.7. Regulatory documents in accordance with which the postgraduate program was developed:

– Federal Law of the Russian Federation “On Education in the Russian Federation” dated December 29, 2012 No. 273-FZ (with subsequent additions and amendments);

– Federal Law of the Russian Federation “On Science and State Scientific and Technical Policy” dated August 23, 1996 No. 127-FZ (with subsequent additions and changes);

– Federal state requirements for the structure of programs for the training of scientific and scientific-pedagogical personnel in graduate school (adjuncture), the conditions for their implementation, the timing of the development of these programs, taking into account various forms of education, educational technologies and the characteristics of certain categories of graduate students (adjuncts) (FGT), approved by order Ministry of Education and Science of the Russian Federation dated October 30, 2021 No. 951;

– Regulations on the training of scientific and scientific-pedagogical personnel in graduate school (adjuncture), approved by the Decree of the Government of the Russian Federation dated November 30, 2021 No. 2122 (hereinafter referred to as the Regulations on training in graduate school);

- Regulations on the practical training of students, approved by order of 08/05/2020 of the Ministry of Education and Science of Russia No. 885 and the Ministry of Education of Russia No. 390;

– Charter of St. Petersburg Electrotechnical University "LETI".

2. Planned results of mastering the PhD program

The postgraduate program includes a scientific component, an educational component, as well as a final certification.

The scientific component of the PhD program includes:

- scientific activity of a graduate student aimed at preparing a dissertation for defense;

- preparation of publications that outline the main scientific results of the dissertation;
- intermediate certification for the stages of scientific research.

The educational component of the postgraduate program includes disciplines and practice, as well as intermediate certification in the specified disciplines and practice.

The final attestation for postgraduate programs is carried out in the form of an assessment of the dissertation for its compliance with the criteria established in accordance with the Federal Law of August 23, 1996 No. 127-FZ "On Science and State Scientific and Technical Policy".

As part of the development of the postgraduate program, a postgraduate student, under the guidance of a supervisor, carries out scientific (research) activities in order to prepare a dissertation for defense.

As part of the implementation of scientific (research) activities, a graduate student:

- solves a scientific problem that is important for the development of the relevant branch of science, or develops new scientifically based technical, technological or other solutions and developments that are essential for the development of the country;

- prepares publications that present the main scientific results of the dissertation in peer-reviewed scientific publications, in equivalent scientific publications indexed in the international databases Web of Science and Scopus and international databases determined in accordance with the recommendations 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 Russian Science Citation Index (RSCI) scientometric database, and (or) applications for patents for inventions, utility models, industrial designs, breeding achievements, certificates of state registration of programs for electronic computers, databases, topologies of integrated circuits;

- independently writes the dissertation manuscript, which has internal unity, contains new scientific results and provisions put forward for public defense, and testifies to the personal contribution of the author of the dissertation to science;

- in a dissertation, which is of an applied nature, provides information on the practical use of the scientific results obtained by him, and in a dissertation, which is of a theoretical nature, - recommendations on the use of scientific findings;

- argues the solutions proposed in the dissertation and evaluates them in comparison with other known solutions.

The number of publications that present the main scientific results of the dissertation for the degree of candidate of sciences in peer-reviewed publications should be:

- in political, sociological, philological, philosophical, economic branches of science - at least 3;

- in other branches of science - at least 2.

A graduate student is obliged to conscientiously master the graduate program. As a result of mastering the program by a postgraduate student, all the learning outcomes specified intable 1.

The totality of the results achieved confirms the ability of the postgraduate student to carry out scientific and scientific-pedagogical activities and to compete for the degree of Candidate of Sciences.

Table 1 - The results of mastering the PhD program

Component	**Results**
Educational component	R 1 Mastered disciplines provided for by the curriculum of the program. The learning outcomes for the disciplines are established by the programs of disciplines.
	P 2 Passed candidate exams in the history of the philosophy of science, a foreign language, in a special discipline in accordance with the topic of the dissertation for the degree of candidate of science (in a scientific specialty).
Scientific component	R 3 Existence of justification for the choice of the topic of the dissertation and a detailed plan for the dissertation research.
	R 4 Availability of published (accepted for publication) articles in peer-reviewed scientific journals or equivalent publications, patents, etc. according to the "Regulations on the award of academic degrees", approved by the GovernmentRussian Federationdated September 24, 2013 No. 842, according to the scientific results of the dissertation.
	P 5 Availability of reports at scientific conferences on the scientific results of the dissertation
	P 6 The presence of the text of the dissertation, prepared in accordance with the requirements of the "Regulations on the award of academic degrees", approved by the GovernmentRussian Federationdated September 24, 2013 No. 842.
	R 7 Successful discussion of the dissertation for the degree of candidate of sciences with the issuance of the conclusion of SPbGETU "LETI" as the organization on the basis of which the dissertation was carried out

3. Structure and content of the PhD program

3.1. The structure of the PhD program is shown in Table 2.

Table 2 - Structure and scope of the PhD program

Name of the components of the PhD program and their components	
1. Scientific component	
1.1	Scientific activity aimed at preparing a dissertation for defense
1.2	Preparation 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
1.3	Intermediate certification by stages of scientific research
2. Educational component	
2.1	Disciplines, including elective, optional disciplines (if they are included in the postgraduate program and (or) aimed at preparing for the candidate's exams)
2.1.1	History and philosophy of science
2.1.2	Foreign language
2.1.3	Special discipline "Computer modeling and design automation"
2.1.4	Discipline at the choice of a postgraduate student (elective)
2.1.5	Special discipline at the choice of a postgraduate student (elective)
2.2	Practice (scientific and organizational)
2.3	Intermediate certification in disciplines and practice
3. Final certification	
3.1	Evaluation of the thesis for its compliance with the criteria established in accordance with the Federal Law "On Science and State Scientific and Technical Policy"

3.2. When implementing the postgraduate program, postgraduate students can master the following elective disciplines:

- Pedagogy of higher education
- Scientific communications

3.3. When implementing a postgraduate program, postgraduate students are provided with the opportunity to master one of the following special optional disciplines:

- Artificial intelligence and machine learning
- Mathematical modeling, numerical methods and software packages
- cyber security
- Radiophysics
- physical electronics
- Acoustics
- Plasma physics
- Physics of semiconductors
- Physical chemistry
- Solid State Chemistry
- Vacuum and Plasma Electronics
- Electronic component base of micro- and nanoelectronics, quantum devices
- Technology and equipment for the production of materials and electronic devices
- Navigation devices
- Optical and Optoelectronic Devices and Complexes
- Photonics
- Methods and devices for monitoring and diagnosing materials, products, substances and the natural environment
- Design and technology of instrumentation and radio electronic equipment
- Information-measuring and control systems
- Devices, systems and products for medical purposes
- Radio engineering, including television systems and devices
- Antennas, microwave devices and their technologies
- Telecommunication systems, networks and devices
- Radar and radio navigation
- System analysis, management and information processing
- Computing systems and their elements
- Automation and control of technological processes and production

- Mathematical and software support for computing systems, complexes and computer networks
- Information security methods and systems, information security
- Informatics and information processes
- Electrotechnical complexes and systems
- Electrotechnology and electrophysics
- Product quality management. Standardization. Organization of production
- Nanotechnologies and nanomaterials
- Mathematical, statistical and instrumental methods in economics
- Regional and sectoral economy
- Finance
- Management
- Social structure, social institutions and processes
- Political institutions, processes, technologies
- Ontology and theory of knowledge
- Philosophy of science and technology
- Social and political philosophy
- Philosophical anthropology, philosophy of culture
- Languages of peoples of foreign countries (Germanic languages)
- Languages of peoples of foreign countries (Romance languages)
- Media communications and journalism

3.4. Elective disciplines (modules) are mandatory for postgraduate students, as they are included in the postgraduate program.

3.5. Optional disciplines are optional for mastering by a graduate student. The work programs of special optional disciplines are contained in the documents of the corresponding postgraduate programs, according to which preparation is carried out at SPbGETU "LETI".

3.6. Postgraduate students who combine the development of a postgraduate program with work activities are entitled to practice at the place of employment in cases where the

professional activity they carry out meets the requirements of the postgraduate program for internship.

3.7. Documents defining the content and implementation of the educational process for the postgraduate program

In accordance with the Regulations on postgraduate training to ensure the implementation of the educational process, the postgraduate program includes the following documents:

1. A plan of scientific activity, which includes an approximate plan for the implementation of scientific research, a plan for preparing a dissertation and publications that set out the main scientific results of the dissertation, as well as a list of stages in the development of the scientific component of the postgraduate program, the distribution of these stages and the final certification of postgraduate students.

2. Curriculum that defines the list of stages of mastering the educational component of the postgraduate program, the distribution of disciplines and practice, the scientific component and the final certification for courses and semesters.

3. Calendar study schedule, reflecting the sequence of implementation of the postgraduate program by years of preparation and semesters, including theoretical training, practice, scientific research, intermediate and final certification, vacations.

4. Work programs of disciplines and practices, including methodological and evaluation tools.

3.8. Evaluation tools for disciplines and practice

In accordance with the FGT for certification of graduate students for the compliance of their personal achievements with the requirements of the graduate program for each type of training, evaluation tools have been developed for conducting current and intermediate control of students. Evaluation tools are a complete and adequate reflection of the requirements of the FGT in the direction of training, correspond to the planned results of mastering the postgraduate program and curricula.

Evaluation tools for each discipline and practice are contained in the work programs of disciplines and practices. Evaluation tools are brought to the attention of graduate students during the first weeks of training.

3.9. final examination

The final attestation is carried out in the form of an assessment of the dissertation for its compliance with the criteria established in accordance with the Federal Law "On Science and State Scientific and Technical Policy". A graduate student who has fully completed the individual curriculum of work, including preparing a dissertation, is allowed to the final attestation. Final certification is mandatory.

4. Requirements for the conditions for the implementation of the postgraduate program

4.1.The requirements for the conditions for the implementation of the postgraduate program include requirements for material, technical, educational and methodological support, for personnel conditions for the implementation of the program.

4.2. Requirements for the logistics of the program implementation

St. Petersburg Electrotechnical University "LETI" provides postgraduate students with access to the research infrastructure in accordance with the postgraduate program and individual work plan.

During the entire period of mastering the postgraduate program, SPbGETU "LETI" provides the postgraduate student with individual access to the electronic information and educational environment of SPbGETU "LETI" through the information and telecommunications network "Internet" and (or) local network within the limits established by the legislation of the Russian Federation in the field of protection of state and other legally protected secrets.

St. Petersburg Electrotechnical University "LETI" provides a postgraduate student with access to educational and methodological materials, library collections and library reference systems, as well as information, information and reference systems, professional databases, the composition of which is determined by the postgraduate program and individual work plan.

The electronic information and educational environment of St. Petersburg Electrotechnical University "LETI" provides a postgraduate student with access to all electronic resources that accompany the research and educational processes of mastering

the postgraduate program, including information about the results of intermediate certifications with the results of the implementation of an individual plan of scientific activity and assessments of the implementation of an individual plan work.

4.3. Requirements toeducational and methodological support of the postgraduate program

The rate of provision of educational activities with educational publications is determined based on the calculation of at least one educational publication in printed and (or) electronic form, sufficient for mastering the postgraduate program, for each postgraduate student in each discipline included in the individual work plan.

When implementing a postgraduate program in a network form, the requirements for the conditions for implementing the program are fulfilled using the resources of several organizations engaged in educational activities, including foreign ones, and, if necessary, using the resources of other organizations using the network form of implementing the postgraduate program.

4.4. Requirements for staffing conditions for the implementation of the postgraduate program

At least 60% of the number of full-time scientific and (or) scientific and pedagogical workers participating in the implementation of the postgraduate program must have an academic degree (including an academic degree obtained in a foreign country 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).