



MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA
Federal State Budgetary Educational Institution of Higher Education
Chelyabinsk State University (FSBEI HE CSU)

Faculty of Mathematics

3. FINAL CERTIFICATION PROGRAM

Document version - 1

page 1 of 21

The first instance _____

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APPROVED

Vice-rector for Scientific Affairs

A.I. Biryukov

24, 02 2025.

3. FINAL CERTIFICATION PROGRAM*

3.1. Final attestation in the form of a certification of the dissertation for its compliance with the criteria established by the legislation of the Russian Federation

Scientific specialty – 1.1.2. Differential equations and mathematical physics

Orientation (profile) – Differential equations and mathematical physics

Higher education – training of highly qualified personnel

The form of study
Full-time

Chelyabinsk, 2025

*The final certification program is adapted for inclusive education of people with disabilities and people with disabilities

 MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)			
Faculty of Mathematics			
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 2 of 21	The first instance _____	COPY No _____

The final certification program was compiled in accordance with the passport of the scientific specialty 1.1.2. Differential Equations and Mathematical Physics and federal state requirements (level of education: higher education - training of highly qualified personnel), approved by Order No. 951 of the Ministry of Science and Higher Education of the Russian Federation dated October 20, 2021.

Program Developers:

Head of the Department of Mathematical Analysis,
 Doctor of Physical and Mathematical Sciences,
 Professor



V.E. Fedorov

The program was approved at the meeting of the Department of Mathematical Analysis on January 24, 2025, protocol No. 7.

The program was approved at the meeting of the Academic Council of the Faculty of Mathematics on January 30, 2025, protocol No. 5.

APPROVED

Dean of the Faculty of Mathematics



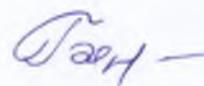
E.A. Sbrodova

Head of the Department
 of Mathematical Analysis



V.E. Fedorov

Head of the Department
 of Postgraduate and Doctoral Studies



N.V. Bochkareva

Head of the Department
 of International Cooperation



N.R. Armutova

 MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)			
Faculty of Mathematics			
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 3 of 21	The first instance _____	COPY No _____

Program summary: the final certification completes the scientific and educational process of mastering the program for the training of scientific and scientific-pedagogical personnel in graduate school and includes:

- submission of a prepared dissertation for the degree of Candidate of Sciences to the department where the graduate student is assigned.

General requirements

1. The final attestation is carried out in the form of a certification of the dissertation for its compliance with the criteria established by the legislation of the Russian Federation.

2. The final attestation may be conducted with the involvement of members of the Council for the defense of dissertations for the degree of Candidate of sciences, for the degree of Doctor of Sciences, who are specialists in the problems of the scientific specialty of the dissertation.

3. Graduate students who have no academic debt and have completed the curriculum in full, including those who have prepared a dissertation for defense in a scientific specialty, are allowed to complete the final certification.

Candidate's examinations are taken in accordance with the scientific specialty and branch of science provided for by the nomenclature of scientific specialties for which academic degrees are awarded, approved by the Ministry of Science and Higher Education of the Russian Federation, and a dissertation has been prepared.

4. In exceptional cases (force majeure, etc.), e-learning and distance learning technologies may be used in the preparation and conduct of final certification.

1. The purpose and objectives of the final certification (FC)

The purpose and objectives of the FC are:

- evaluation of the dissertation for its compliance with the criteria established in accordance with Federal Law No. 127-FZ of August 23, 1996 On Science and State Scientific and Technical Policy;

- the level of readiness and ability of a graduate student in a scientific specialty 1.1.2. Differential equations and mathematical physics to carry out research activities aimed at obtaining and applying new knowledge in professional activities.

In accordance with the requirements of the program in the scientific specialty 1.1.2. Differential equations and mathematical physics, the graduate must have the following characteristics of professional activity.

 MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)			
Faculty of Mathematics			
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 4 of 21	The first instance _____	COPY No _____

CHARACTERIZATION OF THE PROFESSIONAL ACTIVITY OF A GRADUATE OF A POSTGRADUATE PROGRAM

The field of professional activity of graduates who have completed the postgraduate program includes research activities in the following areas:

- in the scientific and industrial sphere - high-tech high-tech industries of the defense industry, the aerospace complex, aircraft construction, mechanical engineering, design and creation of new materials, construction, research and analytical centers of the profile;
- in the socio-economic sphere – foundations, insurance and management companies, financial organizations and business structures, as well as educational institutions of higher education.

The objects of professional activity of graduates who have completed the postgraduate program are: concepts, hypotheses, theorems, physico-mathematical models, numerical algorithms and programs, methods of experimental research of properties of materials and natural phenomena, physical and chemical processes that make up the content of fundamental and applied mathematics, mechanics and other natural sciences.

Types of professional activities of graduates

Scientific research activities in the field of fundamental and applied mathematics, mechanics and natural sciences.

Teaching in mathematics, mechanics, and computer science.

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

2. The place of FC in the structure of the educational program

3.1. Final certification in the form of a certification of the dissertation for its compliance with the criteria established by the legislation of the Russian Federation: the total work intensity according to the curriculum is 6 credits / 216 hours, including independent work – 5.8 credits / 208 hours, control – 0.2 credits / 8 hours.

The dissertation is carried out in accordance with the Regulations on the award of academic degrees, approved by Decree of the Government of the Russian Federation dated September 24, 2013 No. 842 "On the procedure for awarding academic degrees", according to the results of the submission of the dissertation for the degree of candidate of Sciences, the organization gives a conclusion (department where the work was performed).

 MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)			
Faculty of Mathematics			
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 5 of 21	The first instance _____	COPY No _____

The conclusion reflects the personal participation of the graduate student in obtaining the results set out in the dissertation, the degree of reliability of the results of the research conducted by the graduate student, their novelty and practical significance, the value of the graduate student's scientific work, the compliance of the dissertation with the requirements established in accordance with the Federal Law "On Science and State Scientific and Technical Policy", scientific specialty (scientific specialties) and the branch of science to which the dissertation corresponds, the completeness of the presentation of the dissertation materials in the works accepted for publication and (or) published by the graduate student.

3. The results of mastering the program of training scientific and scientific-pedagogical personnel in postgraduate studies

The results of the postgraduate research and teaching staff training program are determined by the ability to apply knowledge, skills and personal qualities in accordance with the chosen type of professional activity.

As a result of mastering the educational program, the student must:

	Content
Know	the basic concepts, results and methods of modern differential equations and dynamical systems
Be able to	to generate new ideas that can be operationalized when solving research and practical problems, based on available resources and limitations
	solve problems related to differential equations, modern methods of dynamical systems and optimal control
	develop and apply methods of modern differential equations, dynamical systems and optimal control to solve problems
Possess	the skills of critical analysis and evaluation of modern scientific achievements and results of activities in solving research and practical problems, including in interdisciplinary areas
	skills in analyzing the main philosophical and methodological problems, including interdisciplinary ones, arising in science at the present stage of its development
	technology of designing the educational process at the higher education level
Have experience in the activity	in critical analysis and evaluation of modern scientific achievements and results of research and practical tasks, including in interdisciplinary fields

 MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)			
Faculty of Mathematics			
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 6 of 21	The first instance _____	COPY No _____

4. The content of the final certification

Final certification in scientific specialty 1.1.2. Differential equations and mathematical physics:

- presentation of the dissertation for the degree of Candidate of Sciences at the meeting of the graduating department in accordance with the approved schedule.

4.1. Presentation of the main results of the prepared dissertation for the degree of Candidate of Sciences

4.1.1. Structure

Type of work	Term								Total
	1	2	3	4	5	6	7	8	
Total labor intensity, acad. hours	-	-	-	-	-	-	-	216	216
Contact work:	-	-	-	-	-	-	-	-	-
Lectures, acad. hours	-	-	-	-	-	-	-	-	-
Practical (seminars), acad. hours	-	-	-	-	-	-	-	-	-
Laboratory work, acad. hours	-	-	-	-	-	-	-	-	-
Independent work, acad. hours	-	-	-	-	-	-	-	208	208
Control	-	-	-	-	-	-	-	8	8
Type of final control	-	-	-	-	-	-	-	FC	-

4.1.2. Content of sections

Section No.	Section name	Number of hours						Form of control
		Total	Contact work				Independent work	
			Lectures	Practical (seminars)	Laboratory work	Control		
1	Presentation of the main results of the prepared dissertation for the degree of Candidate of Sciences	216	-	-	-	8	208	Presentation (FC)
		216	-	-	-	8	208	

The conditions and requirements for the dissertation for the degree of Candidate of Sciences are fulfilled in accordance with the Federal State Budget and regulatory documents established by the legislation of the Russian Federation, as well as local regulations of the university.

 MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)			
Faculty of Mathematics			
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 7 of 21	The first instance _____	COPY No _____

The presentation of the main results of the prepared dissertation for the degree of Candidate of sciences is the final stage of the training of scientific and scientific-pedagogical personnel - final certification.

The dissertation research is conducted in accordance with the specialty passport.

Field of science:

Mathematics and Mechanics

Group of scientific specialties:

1.1. Mathematics and Mechanics

The name of the branch of science in which academic degrees are awarded:

Differential equations and mathematical physics

The cipher of the scientific specialty:

1.1.2. Differential equations and mathematical physics

Research directions:

1. General theory of differential equations and systems of differential equations.
2. Initial boundary value and spectral problems for differential equations and systems of differential equations.
3. Qualitative theory of differential equations and systems of differential equations.
4. Dynamical systems, differential equations on manifolds.
5. Nonlinear differential equations and systems of nonlinear differential equations.
6. Analytical theory of differential equations.
7. Theory of pseudodifferential operators.
8. Theory of differential operator equations.
9. Theory of differential functional equations.
10. Asymptotic theory of differential equations and systems.
11. Theory of differential inclusions and variational inequalities
12. Differential equations and systems of differential equations in optimal control problems and calculus of variations

The dissertation for the degree of candidate of sciences should be written by the graduate student independently, have internal unity, contain new scientific results and provisions put forward for public defense. The postgraduate student's conclusions should be reasoned and aimed at solving a problem that is essential for the relevant branch of knowledge. An applied study should provide information on

 MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)			
Faculty of Mathematics			
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 8 of 21	The first instance _____	COPY No _____

the practical use of the results obtained; a theoretical scientific study should contain recommendations on the use of scientific conclusions.

5. Specifics of the organization of the final certification procedure for persons with disabilities

5.1. For students with disabilities, the final assessment is carried out taking into account the specifics of their psychophysical development, their individual capabilities and state of health (hereinafter referred to as individual characteristics).

In exceptional cases (force majeure, etc.), e-learning and distance learning technologies may be used in the preparation and conduct of final certification, taking into account the specifics of their psychophysical development, their individual capabilities and health status.

5.2. During the FC, compliance with the general requirements is ensured:

- conducting state final certification for the disabled in the same classroom, together with students without disabilities (hereinafter referred to as FCS), if this does not create difficulties for students during the FC;

- the presence of an assistant(s) in the classroom who provides students with disabilities with the necessary technical assistance, taking into account their individual characteristics (to take a workplace, move around, read and complete assignments, communicate);

- the use of the necessary technical means for students with disabilities during the final certification, taking into account their individual characteristics;

- ensuring the possibility of unhindered access of students with disabilities to classrooms, toilets and other rooms, as well as their stay in these rooms (the presence of ramps, handrails, extended doorways, elevators, in the absence of elevators, the auditorium should be located on the ground floor, the presence of special chairs and other devices).

5.3. All local regulations of the CSU Federal State Budgetary Educational Institution on the issues of final certification are brought to the attention of students with disabilities in a form accessible to them.

5.4. Upon the written application of a student with a disability, the duration of the final attestation examination by a student with a disability may be increased in relation to the established duration of its completion: the duration of the state examination conducted in writing is no more than 90 minutes.;

- the duration of the student's preparation for the final assessment, conducted orally, is no more than 20 minutes.;

- the duration of the student's speech when presenting the results of the dissertation research is no more than 15 minutes.

 MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)			
Faculty of Mathematics			
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 9 of 21	The first instance _____	COPY No _____

5.5. Depending on the individual characteristics of students with disabilities, CSU ensures that the following requirements are met during the final certification test:

a) for the blind:

assignments and other materials for passing the final certification test are drawn up in relief-dotted Braille or in the form of an electronic document accessible using a computer with specialized software for the blind, or are read out by an assistant.;

Written tasks are performed by students on paper in relief-dotted Braille, or performed on a computer with specialized software for the blind, or dictated by an assistant.;

If necessary, students are provided with a set of writing materials and paper for writing in relief-dotted Braille, a computer with specialized software for the blind.;

b) for the visually impaired:

assignments and other materials for passing the final certification test are drawn up in enlarged font;

individual uniform illumination of at least 300 lux is provided;

If necessary, students are provided with magnifying devices, it is allowed to use magnifying devices available to students.;

c) for the deaf and hard of hearing, with severe speech impairments:

The availability of sound-amplifying equipment for collective use is ensured, if necessary, students are provided with sound-amplifying equipment for collective use.;

At their request, the final tests are conducted in writing.;

d) for people with disorders of the musculoskeletal system (severe disorders of the motor function of the upper extremities or the absence of upper extremities):

Written assignments are performed by students on a computer with specialized software or dictated by an assistant.;

at their request, the final certification tests are conducted orally.

5.6. A student with a disability, no later than 3 months before the start of the IA, submits a written statement on the need to create special conditions for him during the final certification examination, indicating the specifics of his psychophysical development, individual capabilities and health status (hereinafter referred to as individual characteristics). The application must be accompanied by documents confirming that the student has individual characteristics (in the absence of these documents in the CSU Federal State Budgetary Educational Institution).

In the application, the student indicates the need (lack of need) for the assistant to be present at the final certification test, the need (lack of need) to increase the

 MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)			
Faculty of Mathematics			
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 10 of 21	The first instance _____	COPY No _____

duration of the final certification test in relation to the established duration (for each certification test).

6. Fund of assessment tools for final certification

6.1. Criteria of competence formation

As part of the final certification, the degree of formation of the graduate's knowledge, skills, and proficiency will be checked.:

No.	Controlled sections of the discipline	Learning outcomes	Name of the evaluation tool
1.	Presentation of the main results of the prepared dissertation for the degree of Candidate of Sciences	know: <ul style="list-style-type: none"> • the main results of scientific research in the field of differential equations and mathematical physics • Modern level of development of problems of differential equations and mathematical physics • Key concepts and terms in the field of differential equations and mathematical physics be able to: <ul style="list-style-type: none"> • Analyze scientific literature on problems of differential equations and mathematical physics • Interpret the obtained research results in the context of differential equations and mathematical physics • Present the main research results and conclusions in an academic article and report posses: <ul style="list-style-type: none"> • Work skills in scientific literature on differential equations and mathematical physics • Scientific research methods applicable to the study of 	Presentation (FC)

 MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)			
Faculty of Mathematics			
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 11 of 21	The first instance _____	COPY No _____

		differential equations and mathematical physics <ul style="list-style-type: none"> • Approaches to the presentation and protection of research results 	
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6.2. Criteria for evaluating a dissertation for the degree of Candidate of Sciences

As part of the presentation of the dissertation for the degree of Candidate of Sciences, the degree of formation of graduate competencies at the level of:

Knowledge:

- methods of critical analysis and evaluation of modern scientific achievements, as well as methods of generating new ideas in solving research and practical problems, including in interdisciplinary fields;
- methodology, specific methods and techniques of scientific research, including using modern computer technologies.

Skills:

- independent design and implementation of scientific activities;
- set a task and carry out scientific research in solving specific tasks in the field of training;
- generate new ideas when solving research and practical tasks;
- analyze alternative solutions to research and practical problems and evaluate the potential gains/losses of implementing these options.

Ownership:

- skills of critical analysis and evaluation of modern scientific achievements and results of activities in solving research and practical problems, including in interdisciplinary fields;
- methods and technologies of goal setting, implementation and evaluation of performance in solving professional tasks;
- planning technologies in professional activities in the field of scientific research.

The dissertation for the degree of Candidate of Sciences is evaluated according to the following criteria (qualification requirements):

 MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)			
Faculty of Mathematics			
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 12 of 21	The first instance _____	COPY No _____

- independence in choosing the topic of work and in conducting scientific research;
- the quality, scientific integrity and unity of the PhD student's scientific and qualifying work;
 - relevance, novelty, theoretical and practical significance of the work;
 - the use of an adequate set of methods (theoretical, empirical and mathematical) in research;
 - the use of information and communication technologies in research and in the design of the results;
 - independence in writing scientific and qualifying work;
 - the presence of reliable, valid and scientifically based results in the work;
 - the possibility of introducing the obtained scientific results into the practice of educational (scientific) organizations, other institutions, enterprises;
 - the prospects of the protected scientific problem stated in the scientific qualification work;
 - compliance of the dissertation with the requirements of GOST R 7.0.11–2011 (the presence of an introduction and certain headings in it, the presence of chapters and conclusions on them, the presence of a general conclusion on the work, the presence of a bibliographic list and appendices), the technical design of the work, the presence of reviews and reviews on the work.

As a result of the submission of the dissertation for the degree of Candidate of Sciences, graduate students can receive the following grades:

«**Excellent**», if the dissertation fully meets the qualification requirements and is recommended for defense.

«**Good**», if the thesis is recommended for defense, taking into account the comments made.

«**Satisfactory**», if the dissertation is recommended for substantial revision.

«**Unsatisfactory**», if the thesis does not meet the qualification requirements.

When evaluating a dissertation for the degree of Candidate of Sciences, the following factors are taken into account:

- review of the supervisor;
- the reviewers' opinion on the work.

 MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)			
Faculty of Mathematics			
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 13 of 21	The first instance _____	COPY No _____

According to the results ("excellent" and "good") of the submitted dissertation for the degree of Candidate of Sciences, the work is recommended for defense for the degree of candidate of Sciences in the dissertation council.

7. Educational and methodological support

The independent work of graduate students is carried out in the form of studying individual theoretical questions on the proposed literature and solving problems independently with their further analysis or discussion in classroom classes. During self-study, students are provided with access to databases and library collections and Internet access.

Independent work contributes to:

- deepening and expanding knowledge;
- formation of interest in independent research activities;
- mastering the techniques of the cognitive process and developing cognitive abilities.

The independent work of graduate students has the main goal – to ensure the quality of training of graduates.

When studying each topic of the discipline, the organization of independent work of graduate students represents a unity of interrelated forms:

- Classroom
- Extracurricular
- Creative research work

When lecturing directly in the audience, the assimilation of the material is monitored by conducting rapid surveys. Types of extracurricular independent work are diverse: preparation and writing of abstracts, reports on a given topic, preparation for participation in scientific and practical conferences, round tables, discussions.

When organizing the independent work of graduate students, the preparation of reports and abstracts is actively used.

The report is a type of independent work that contributes to the formation of competencies for the formation of research skills, expands cognitive interests, and teaches critical thinking.

An abstract is a summary in writing or in the form of a public report of the content of a scientific work. This is an independent work by a graduate student, where the author reveals the essence of the research of the problem, provides various positions and his own views.

 MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)			
Faculty of Mathematics			
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 14 of 21	The first instance _____	COPY No _____

Educational and methodological materials for the independent work of students with disabilities and persons with disabilities are provided in forms adapted to the limitations of their health and perception of information.

Main literature

(* literature available in the CSU library or electronic library system;
 ** literature available in the electronic library system)

- 1.** Pantelev, A. V. Optimization methods in examples and problems: a tutorial / A. V. Pantelev, T. A. Letova. - 4th ed., corrected. - St. Petersburg: Lan, 2022. - 512 p. - ISBN 978-5-8114-1887-9. - Text: electronic // Lan: electronic library system. — URL: <https://e.lanbook.com/book/212129>
- 2.* Filippov, A. F. Introduction to the theory of differential equations [Text]: textbook for universities / A. F. Filippov. — Stereotype ed. — Moscow: [Lenand, 2015]. — 239 p.
3. ** Rozendorn, E. R. Partial differential equations: textbook / E. R. Rozendorn, E. S. Soboleva, G. M. Fateeva. — 2nd ed. — Moscow: FIZMATLIT, 2017. — 336 p. — ISBN 978-5-9221-1756-2. — Text: electronic // Lan: electronic library system. — URL: <https://e.lanbook.com/book/104991>

Further reading

1. * Isaacs, R. Differential Games [Text] / R. Isaacs; trans. from English by V. I. Arkin, E. N. Simakova; edited by M. I. Zelikin; foreword by L. S. Pontryagin. – Moscow: Mir, 1967. – 479 p.
2. * Alekseev, V. M. Optimal Control [Text]: a textbook for universities / V. M. Alekseev, V. M. Tikhomirov, S. V. Fomin. – Moscow: Nauka, 1979. – 430 p.
3. ** Vasilyeva, E. V. Periodic systems of differential equations with an infinite set of stable periodic solutions : monograph / E. V. Vasilyeva. — St. Petersburg : Lan, 2022. — 130 p. — ISBN 978-5-8114-1893-0. — Text : electronic // Lan: electronic library system. — URL: <https://e.lanbook.com/book/212081>
4. * Demidenko, G. V. Equations and Systems Not Resolved with Respect to the Highest Derivative [Text] / G. V. Demidenko, S. V. Uspensky. — Novosibirsk : Nauch. kn., 1998. — 438 p.
5. * Ioffe, A. D. Theory of Extremal Problems [Text] / A. D. Ioffe, V. M. Tikhomirov. — Moscow : Nauka, 1974. — 479 p.
6. * Krasovskii, N. N. Positional differential games [Text] / N. N. Krasovskii, A. I. Subbotin. – Moscow : Nauka, 1974. – 456 p. : ill. – Subject index: p. 456.

 MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)			
Faculty of Mathematics			
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 15 of 21	The first instance _____	COPY No _____

7. * Laks, P. D. Hyperbolic partial differential equations [Text] / P. D. Laks ; trans. from English by A. A. Korshunova ; edited by O. S. Rozanova. – Moscow ; Izhevsk: Regular and Chaotic Dynamics: Institute of Computer Research, 2010

8. * Oleynik, O. A. Lectures on partial differential equations [Text] / O. A. Oleinik. — 2nd ed., corrected. and add. – M.: BINOM. Knowledge Laboratory, 2005. – 260 p.

9. * Pontryagin, L. S. Mathematical Theory of Optimal Processes [Text] / L. S. Pontryagin [et al.]. — 4th ed., reprinted — Moscow: Nauka, 1983. — 392 p.

10. * Pontryagin, L. S. Ordinary Differential Equations [Text]: textbook for state universities / L. S. Pontryagin. — Moscow: Fizmatgiz, 1961. — 311 p.

11. * Sviridyuk, G. A. Linear equations of Sobolev type : Textbook for universities / G. A. Sviridyuk, V. E. Fedorov. — Chelyabinsk : Publishing house of Chelyabinsk State University, 2003. — 179 p.

12. * Filippov, A. F. Differential equations [Text]: guidelines for correspondence students of mathematical faculties of universities / A. F. Filippov. — M. : Moscow State University Press, 1986. — 65 p.

13. * Shubin, M. A. Pseudodifferential operators and spectral theory [Text] / M. A. Shubin. — M. : Nauka, 1978. — 279 p.

Electronic funds and resources

The library's website is a means of accessing the system of its own electronic resources www.lib.csu.ru. The electronic catalog provides a complete and up-to-date view of the library's collection, improves the quality and efficiency of information retrieval - more than 1.5 million entries.

1. Electronic catalog. Bibliographic databases.

Books, electronic resources, dissertations and abstracts.

2. Electronic library.

Publications of CSU, UMK; dissertations defended in the councils of CSU, reserve collections, rare book fund, electronic reference book "Informio", statistical publications of Russia and the CIS countries.

3. Abstracts

INION RAS databases, VINITI databases, Scopus (<http://www.scopus.com>), Science (archive).

4. Full-text

Databases of dissertations of the Russian State Library of Economics, ARBICON, SIGLA, scientific electronic library <http://elibrary.ru>, subscription to the full-text collection of Russian scientific journals (2011-2015, 148 titles), publishers: Taylor&Francis, Sage Publications (archive of scientific journals); Springer, American Physical Society (<http://www.journals.aps.org/about>),

 MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)			
Faculty of Mathematics			
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 16 of 21	The first instance _____	COPY No _____

American Mathematical Society (<http://www.ams.org/mathscinet>), Wiley (<http://onlinelibrary.wiley.com>).

5. *Electronic library systems with the ability to use licensed materials from anywhere with access to the Internet (registration from the university's personal account network):*

University Library online (www.biblioclub.ru), Fallow Deer (www.e.lanbook.com).

Licensed software

MS Office365,
Adobe Reader

8. Logistics and technical support

To carry out the research work provided for in the postgraduate training curriculum, there is the necessary material and technical base that complies with current sanitary and fire safety rules and regulations, ensuring all types of theoretical and practical training, as well as effective completion of final qualifying work (dissertation):

- lecture halls equipped with multimedia complexes based on an anti-vandal rostrum
- specialized computer classrooms with a peripheral device and equipment connected to them;
- methodological materials for conducting independent work (room 441a) in the discipline.

The Faculty of Mathematics has educational and research laboratories equipped with modern computers and multimedia complexes: an educational and computing laboratory (2 computer classrooms, 24 computers), a laboratory of methods for optimizing and modeling game situations, an educational and scientific laboratory for computer geometry, an educational and scientific laboratory for differential equations and operator theory of the Department of Mathematical Analysis, a scientific-research laboratory of quantum topology, educational and scientific laboratory of technical training facilities (10 computers), educational and scientific laboratory "Network polygon" (15 computers). All computers of the departments and laboratories of the Faculty of Mathematics are connected by a local network and have Internet access. The faculty has its own website math.csu.ru , which contains educational and scientific materials developed by the faculty staff. A room for independent work (rooms 205,206). All computers are connected by

 MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)			
Faculty of Mathematics			
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 17 of 21	The first instance _____	COPY No _____

local networks and have Internet access. The university's own website is supported: <http://csu.ru> .

In order to receive higher education in postgraduate programs for people with disabilities and persons with disabilities, the university has classrooms equipped with the following equipment:

Cabinet name	Equipment
Tiflotechnical auditorium, office A-28 of the first academic building	Typhlotechnical equipment: a Braille computer with a display and printer, a typhlocomplex "Reading machine", a TELEVISION magnifying device, cassette tape recorders (3 pcs.) and digital voice recorders (6 pcs.). Special software: JAWS speech navigation program, speech synthesizers ("talking mouse"), screen magnifiers.
Sign language classroom, office A-27 of the first academic building	Sonet-R radio class (for 6 people), programmable hearing aids (6 pcs.) for individual use with a device for setting the operating mode on a computer, audio equipment.
Auditorium of adaptive information technologies, room A-27 of the first academic building	A computer lab with 12 seats, an interactive Activboard with a voting system, an acoustic amplifier and speakers, a multimedia projector, a TV, a video recorder, a VCON HD3000 video conferencing device.

All the methodological and technical support of the educational process for the disabled and people with disabilities specified in this work program of the discipline is provided by the Regional Educational and Scientific Center for Inclusive Education of CSU.

9. Methodological guidelines for students

The main type of work of graduate students of the final attestation is the preparation of a dissertation for the degree of Candidate of Sciences.

The dissertation is a research paper performed by a graduate student, which outlines the essence of the problem, provides confirmed facts, and expresses the obtained own scientific results of scientific research.

The structure of the dissertation presentation: 1) Introduction. It is usually dedicated to greeting; 2) introduction. This part reviews the main issue that will be raised in the report; 3) the main part. This part presents the main body of information on the results of the dissertation research. A high-quality report must have a small conclusion that allows you to draw a conclusion from the information provided. The text should be written in a scientific style. It is recommended to use the following rules when writing a paper: avoid using long and difficult-to-understand sentences; do not use foreign words that are rarely used in Russian;

 MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)			
Faculty of Mathematics			
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 18 of 21	The first instance _____	COPY No _____

minimize the use of introductory constructions that do not carry a semantic load. The duration of the report is up to 15 minutes.

The report is accompanied by a presentation of the files with the main results. The files contain statements, figures, graphs, and tables illustrating the research. The main requirement for illustrative materials is clarity, brevity and concreteness.

Individual work is of great importance in preparing for the final certification with people with disabilities and people with disabilities. Individual work means two forms of interaction with a teacher: individual work (consultations), i.e. additional clarification and in-depth study of the material with those students who are interested in it, and individual educational work. Individual consultations on the subject are an important factor contributing to the individualization of learning and the establishment of educational contact between a teacher and a student with a disability or a student with disabilities.

A dissertation for the degree of Candidate of Sciences should be a scientific qualification work that contains a solution to a scientific problem that is important for the development of the relevant branch of knowledge, or outlines new scientifically sound technical, technological or other solutions and developments that are essential for the development of the country. The solutions proposed by the author of the dissertation should be reasoned and evaluated in comparison with other known solutions.

The main scientific results of the dissertation should be published in peer-reviewed scientific journals.

Publications in peer-reviewed publications presenting the main scientific results of a dissertation are equivalent to publications in scientific publications indexed in international databases determined in accordance with the recommendation of the Higher Attestation Commission.

Publications presenting the main scientific results of a dissertation for the degree of Candidate of Science in peer-reviewed publications include patents for inventions, utility models, industrial designs, breeding achievements, certificates of state registration of programs for electronic computers, databases, and topologies of integrated circuits.

The number of publications in which the main scientific results of the dissertation for the degree of Candidate of Sciences are presented in peer-reviewed publications should be:

- in social sciences and humanities - at least 3;
- in natural sciences and technical sciences - at least 2.

In the dissertation, the candidate for an academic degree is obliged to refer to the author and (or) the source of borrowing materials or individual results. When using

 MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)			
Faculty of Mathematics			
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 19 of 21	The first instance _____	COPY No _____

in the dissertation the results of scientific works performed by the candidate of an academic degree personally and (or) in co-authorship, the candidate of an academic degree is obliged to note this circumstance in the dissertation.

Presentation and defense of the thesis

The candidate for the academic degree submits the dissertation on paper as a manuscript and in electronic form.

The requirements for dissertation design are established by the Ministry of Science and Higher Education of the Russian Federation.

The dissertation and the abstract are submitted to the dissertation council in Russian. The thesis is defended in Russian, and, if necessary, the dissertation council provides simultaneous translation into another language.

A foreign citizen who has prepared a dissertation for an academic degree is granted the right to defend a dissertation in a foreign language in the dissertation council, if local regulations governing the activities of such a dissertation council provide for the possibility of defending a dissertation in a foreign language. In this case, the dissertation and the abstract are submitted to the dissertation council in Russian and in a foreign language.

The CSU Federal State Budgetary Educational Institution (the department where the dissertation was performed) gives an opinion on the compliance of the dissertation with the criteria established in accordance with the Federal Law "On Science and State Scientific and Technical Policy" (hereinafter referred to as the conclusion), which is signed by the head or, on his behalf, by the deputy head (vice-rector).

In order to prepare the conclusion, the University has the right to involve members of the dissertation defense council for the degree of candidate of sciences, for the degree of Doctor of Sciences, who are specialists in the problems of each scientific specialty of the dissertation.

The conclusion reflects the personal participation of the graduate student in obtaining the results set out in the dissertation, the degree of reliability of the results of the research conducted by the graduate student, their novelty and practical significance, the value of the graduate student's scientific work, the compliance of the dissertation with the requirements established in accordance with the Federal Law "On Science and State Scientific and Technical Policy", scientific specialty (scientific specialties) and the branch of science to which the dissertation corresponds, the completeness of the presentation of the dissertation materials in the works accepted for publication and (or) published by the graduate student.

A postgraduate student who has successfully passed the final certification under the postgraduate program, no later than 30 calendar days from the date of the

	MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA Federal State Budgetary Educational Institution of Higher Education Chelyabinsk State University (FSBEI HE CSU)		
	Faculty of Mathematics		
3. FINAL CERTIFICATION PROGRAM			
Document version - 1	page 20 of 21	The first instance _____	COPY No _____

final certification, is issued a conclusion and a certificate of completion of postgraduate studies.

The conclusion of the organization on the dissertation is valid for 3 years from the date of its approval by the head of the organization or an authorized person.

An applicant for an academic degree has the right to submit a dissertation for defense to any dissertation council. At the same time, the scientific specialty (scientific specialties) and the branch of science in which the dissertation is performed must correspond to the scientific specialty (scientific specialties) and the branch of science in which the dissertation council has been granted the right to defend dissertations by the Ministry of Science and Higher Education of the Russian Federation.



Document version - 1	page 21 of 21	The first instance _____	COPY No _____
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No. change	Page number			Date of the change	Date of introduction of the change	Total sheets in the document	Signature of the person responsible for the change
	modified	new	withdrawn				