

MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION
FEDERAL STATE AUTONOMOUS EDUCATIONAL INSTITUTION OF HIGHER
EDUCATION
NORTH CAUCASUS FEDERAL UNIVERSITY

APPROVED BY:

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WORK PROGRAM ON THE DISCIPLINE (MODULE)
WRITING AND ACADEMIC COMMUNICATION FOR INTERNATIONAL
ELECTRONICS JOURNALS / НАПИСАНИЕ ТЕКСТОВ И НАУЧНАЯ
КОММУНИКАЦИЯ ДЛЯ МЕЖДУНАРОДНЫХ ЖУРНАЛОВ ПО ЭЛЕКТРОНИКЕ

Training program	02.04.01 Mathematics and Computer Sciences
Directivity (profile)	Training Program for Electronic Information
Year of admission	2026
Mode of study	intramural
Implemented in the semester	1 _____

Developed by

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1. The purpose and objectives of mastering the discipline (module)

To provide students with a systematic theoretical and practical basis in the field of academic writing, publication strategy and organization of scientific research, allowing them to independently prepare, design and publish the results of scientific work in peer-reviewed journals and conferences. The discipline establishes the necessary competence base for effective communication with the scientific community, compliance with academic ethics and successful completion of all stages of research work.

Objectives of the discipline:

1. To master the typology of scientific publications and the criteria for choosing a scientific journal.
2. Acquire skills in working with academic platforms (Scopus, Web of Science, PubMed, ResearchGate) to systematically review literature, identify research gaps, and analyze scientific abstracts.
3. To study the methodology of citation and techniques of correct attribution of sources: summarization, paraphrase, direct citation, as well as the design of references.
4. Develop the ability to distinguish between forms of academic violations (intentional and mosaic plagiarism, self-citation) and apply ethical standards in research work.
5. Learn how to design an experiment with the control of independent and dependent variables, randomization, blinding and calculation of sample size, as well as interpret and visualize the results.
6. Master article submission systems and author profile management tools for successful completion of the editorial and publishing cycle.

2. The place of the discipline (module) in the structure of the educational program

The discipline “Writing and Academic Communication for International Electronics Journals / Написание текстов и научная коммуникация для международных журналов по электронике” (Index: B1.O.04) belongs to Block 1, Mandatory Part of the Master’s educational program 02.04.01 Mathematics and Computer Sciences. It is implemented in Semester 1 and carries 4 credit units. The course is the most important prerequisite for advanced modules in Semester 3, including Scientific Research Work.

3. List of planned learning outcomes in the discipline (module) correlated with the planned outcomes of the educational program

Competency code, description	Indicator code, description	Planned learning outcomes in the discipline (module) characterizing the stages of competencies and indicators formation
UC-4 Able to apply modern communication technologies, including in a foreign language(s), for academic and professional interaction	ID-1 uses the basics of establishing different types of communication (oral, written, business, intercultural, network, etc.) when solving professional tasks	Competently and fully uses the basics of establishing various types of communication (oral, written, business, intercultural, network, etc.) when solving professional tasks.
	ID-2 uses various types of communication technologies for academic and professional interaction	Competently applies various types of communication technologies for academic and professional interaction.
OPC-1 Able to apply fundamental knowledge and modern programming technologies to solve	ID-1 Implements basic machine learning algorithms for classification (Python/NumPy)	Implements machine learning models; demonstrates an understanding of complexity trade-offs; includes comprehensive testing; works correctly with

professional problems		programming results.
	ID-2 Able to work with code, understands the logic and meaning of the program	He is able to work with the code, understands the logic and meaning of the program, can answer questions about the code, is able to independently change the code or its logic.

4. The scope of the academic discipline (module) and control forms*

Scope of classes:	c.u.	Acad. hours
Total:	4	144
Lectures		-
Laboratory works		-
Practical lessons		32
Independent work		112
Control forms:		
Pass		-

5. Content of the discipline (module), structured by topics (sections) with an indication of the number of hours and types of training sessions

No.	Section (topic) of the discipline	Implemented competencies, indicators	Contact work of students with a teacher, hours			Independent work, hours
			Lectures	Practical lessons	Laboratory works	
1 semester						
1	Typology of scientific publications	UC-4.1, UC-4.2	–	2.00	–	7.00
2	Working with sources and databases, selecting suitable articles	UC-4.1, UC-4.2	–	2.00	–	7.00
3	Critical selection and relevance assessment of literature sources	UC-4.1, UC-4.2	–	2.00	–	7.00
4	Writing a literature review and citation	UC-4.1, UC-4.2	–	2.00	–	7.00
5	Analysis of literature sources	UC-4.1, UC-4.2	–	2.00	–	7.00
6	LaTeX – design of the text, headings, and sections of the article	UC-4.1, UC-4.2	–	2.00	–	7.00
7	LaTeX – design of the list of references	UC-4.1, UC-4.2	–	2.00	–	7.00
8	Creating a Timeline	UC-4.1, UC-4.2	–	2.00	–	7.00
9	Introduction, relevance and objectives of the study	UC-4.1, UC-4.2	–	2.00	–	7.00
10	Conducting research, preparing a Dataset	OPC-1.1, OPC-1.2	–	2.00	–	7.00
11	Conducting research, working with ML models	OPC-1.1, OPC-1.2	–	2.00	–	7.00
12	Conducting research, working with the results of forecasting	OPC-1.1, OPC-1.2	–	2.00	–	7.00
13	Methodology and results of the study	UC-4.1, UC-4.2	–	2.00	–	7.00
14	Conclusion, inputs, abstract, keywords	UC-4.1, UC-4.2	–	2.00	–	7.00
15	Reviewing	UC-4.1, UC-4.2	–	2.00	–	7.00

16	Report and presentation of research results	UC-4.1, UC-4.2	–	2.00	–	7.00
	TOTAL for the 1d semester		–	32.00	–	112.00
	TOTAL		–	32.00	–	112.00

6. Assessment Tools Fund for the continuous monitoring of progress and intermediate certification of students in the discipline (module)

The Assessment Tools Fund (ATF) for "Writing and Academic Communication for International Electronics Journals / Написание текстов и научная коммуникация для международных журналов по электронике" is designed to objectively measure the formation of competencies **UC-4.1, UC-4.2 OPC-1.1, OPC-1.1** through a multi-component evaluation system aligned with the 144-hour workload.

6.1. Structure of assessment components

Assessment type	Weight	Timing	Competencies assessed	Format
Practical Lesson Report (16 tasks)	100%	Weeks 1-8	UK-4.1, UK-4.2, OPC-1.1, OPC-1.1	Work on writing an article, conducting an experimental study

6.2. Competency-specific assessment criteria

For UC-4.1, UC-4.1:

Excellent (90-100%): The student correctly presented the main sections of the research paper: literature review, methodology, conclusions, references.

Satisfactory (70-89%): The student made minor but not critical inaccuracies in the presentation of the main sections of the research paper: literature review, methodology, conclusions, references.

Unsatisfactory (<70%): The student incorrectly described the research methodology or interpreted the results.

For OPC-1.1, OPC-1.2:

Excellent (90-100%): The student has fully completed the tasks for working with the dataset, including: data cleaning, model training, evaluation and analysis of the predicted result.

Satisfactory (70-89%): The student fully completed the tasks for working with the dataset, but the prediction results turned out to be low accuracy.

Unsatisfactory (<70%): The student incorrectly prepared the data, trained the model.

6.3. Continuous monitoring procedures

Automated testing of lab submissions via university CI/CD pipeline (unit tests for core functions).

Peer code review sessions to develop collaborative debugging skills.

Mandatory revision cycle: students resubmit lab reports with corrections within 7 days to receive full credit.

7. Methodological guidelines for students on mastering the discipline

7.1. Course organization and expectations

This discipline takes place in an intensive 8-week format (semester 1) with practical lessons (4 hours per week). The remaining 112 hours are allocated for independent work. Success requires constant weekly work; the backlog is difficult to fill because of the accumulated material.

7.2. Preparation strategy

Before each lecture:

Review the training materials for the current lesson.

Prepare 1-2 questions about conceptual difficulties.

During laboratory sessions:

Follow the instructions of the practical work carefully, and complete the tasks consistently.

Save the interim results for comparative analysis in reports.

Independent work (58 hours) guidance:

Weeks 1-4: Focus on working with literature sources, writing a review, working with citations, and the overall structure of scientific research.

Weeks 5-8: Focus on conducting the experiment, working with the dataset, and interpreting the results.

7.3. Academic integrity and collaboration policy

Code sharing is only allowed to help with debugging; all submitted work must be written individually.

The use of generative artificial intelligence tools is strictly allowed to perform tasks related to its direct use.

All external sources (articles, tutorials, Stack Overflow fragments) must be specified in the reports.

8. Teaching and learning materials on the discipline

8.1. List of essential and supplementary literature

8.1.1. Essential literature (core textbooks):

1. Barjak, F. (2006a). Research productivity in the Internet era. *Scientometrics*, 68(3), 343–60.
2. Golden, J & Carstensen, F. V. (1992). Academic research productivity, department size and organisation: Further results, comment. *Economics of Education Review*, 11(2), 153–60.
3. Hermanowicz, J. C. (2006). What does it take to be successful? *Science, Technology & Human Values*, 31(2), 135–52.

8.1.2. Supplementary literature (advanced/reference):

1. Prpic, K. (1996). Scientific fields and eminent scientist's productivity patterns and factors. *Scientometrics*, 37(3), 445–71.
2. Tschannen-Moran, T. & Nestor-Baker, N. (2004). The tacit knowledge of productive scholars in education. *Teachers College Record*, 106(7), 1484–511.
3. Zainab, A. N. (1999). Personal, academic and departmental correlates of research productivity: A review of the literature. *Malaysian Journal of Library & Information Science*, 4(2), 73–110.

8.2. Internet resources and software environment

Essential online resources:

1. LaTeX (Overleaf) documentation: <https://www.overleaf.com/learn> – a guide to commands, environments, and inserting tables and figures.
2. Scopus and Web of Science (via institutional access): <https://www.scopus.com> and <https://www.webofscience.com> – search for sources, impact factors, quartiles of journals.
3. ResearchGate: <https://www.researchgate.net> – search for articles, tracking citations, requesting full texts from authors.

Software requirements:

Python 3.9+ with NumPy

LaTeX distribution kit (TeX Live - for local work) or Overleaf online editor

9. List of information technologies used in the course of educational process in the discipline (module), including a list of software and information reference systems

The list of information technologies used in the course of the educational process in the discipline (module) includes both software for the preparation and formatting of scientific texts, as well as information and reference systems for searching, analyzing and managing literature sources. To work with scientific publications and design manuscripts, students use the LaTeX environment (the local TeX Live distribution or the Overleaf online editor) in combination with BibTeX or BibLaTeX to automatically generate bibliographic lists and cross-references. For data processing, visualization, and statistical analysis (as part of practical exercises on research methodology and interpretation of results), the JupyterLab environment is used, provided through the university cloud workspace, with a Python interpreter version 3.9 and higher and libraries NumPy, SciPy, Matplotlib, Pandas, and Seaborn. As information and reference systems, students work with the academic platforms Scopus, Web of Scienc and ResearchGate to search for scientific articles, check impact factors and quartiles of journals. Additionally, work with the ORCID, Google Scholar Profiles, and Scopus Author ID platforms is provided for managing the author's profile. All listed information technologies and systems are available through the university network or as publicly available online resources.

10. Description of the material and technical support necessary for the educational process in the discipline (module)

The learning process requires a specialized logistical base to support both theoretical learning and practical algorithm development within the approved 144-hour workload. Lecture-type classes are held in a classroom equipped with projection capabilities (at least 3,000 lumens, 1920 × 1080 resolution), a motorized screen and audio amplification to ensure a clear presentation of mathematical conclusions and visualization of algorithms. The instructor's workplace includes a desktop computer with a dedicated graphics processor (NVIDIA RTX 3060 or higher), 32 GB of RAM, and a dual-monitor configuration to facilitate real-time code demonstration and visualization of filter responses, epipolar geometry overlays, and 3D reconstruction previews.

Laboratory classes require student workstations that meet the minimum requirements of a 4-core processor, 8 GB of RAM, and 256 GB of SSD storage, with recommended configurations including 16 GB of RAM and a dedicated graphics processor (NVIDIA GTX 1660 or higher) for high-computing tasks such as wavelet decomposition, and package configuration. All computers run either Ubuntu 20.04 LTS or Windows 10/11 with WSL2 to ensure compatibility with the Python scientific stack. The required software environment includes Python 3.9 or later, NumPy.

11. Features of mastering the discipline (module) by persons with disabilities

The educational process is organized in accordance with the principles of inclusive higher education and the requirements of an accessible learning environment. Students with disabilities are provided with individual facilities that maintain the academic rigor of the course while ensuring equal access to all learning activities, including lectures, laboratory classes, independent work, and assessment procedures.

For students with visual impairments, the course materials are adapted to support non-visual or visually impaired interaction with visual content. All algorithmic explanations and mathematical conclusions are provided in text formats compatible with screen readers. The results of image processing and visualization are accompanied by detailed text descriptions of key objects, such as the location of edges, segmentation boundaries, or reconstruction quality indicators. Where visual control is important from a pedagogical point of view, alternative tactile or ultrasound representations of image data can be used, and students are allowed to work with high-contrast display settings, screen magnification tools, or auxiliary software. Lab tasks in development environments can be performed using keyboard-only navigation, and code templates are provided with comprehensive built-in documentation to reduce reliance on visual debugging.

For students with motor or mobility impairments affecting the function of the upper extremities, the course includes alternative data entry methods for programming and laboratory work. Reports are sent using voice-to-text conversion systems, adaptive keyboards, or through an assistant who decrypts the dictated code under the direct supervision of the student. The time frame for completing laboratory assignments and exams increases in proportion to the documented needs of the student. It is recommended to use integrated development environments with customizable shortcuts, code completion, and macro support to minimize repetitive keystrokes.

For students with hearing impairments, all oral instructions during lectures and laboratory consultations are supplemented with real-time subtitles or sign language translation on request.

Assessment procedures are adapted to maintain reliability based on individual needs.

12. Features of the implementation of the discipline with the use of distance learning technologies and e-learning

The implementation of the discipline using distance learning technologies and e-learning is organized in accordance with Federal Law No. 273-FZ "On Education in the Russian Federation" and the regulatory framework of the North Caucasus Federal University. The course is designed to maintain full academic rigor and develop practical competencies regardless of the method of delivery, ensuring that remote students achieve the same learning outcomes as those who attend classes on campus.