

MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION  
Federal State Autonomous Educational Institution of Higher Education  
NORTH CAUCASIAN FEDERAL UNIVERSITY

**I APPROVE**

Dean of the Faculty of  
Mathematics  
and computer science named after  
Professor N.I. Chervyakov,  
Candidate of Physical and  
Mathematical Sciences, Associate  
Professor  
Grobova T.A.

**WORKING PROGRAM OF THE DISCIPLINE**

Innovative Training Practice Course (Mathematical Modeling) / Инновационный курс  
практического обучения (математическое моделирование)

|                                 |                                             |
|---------------------------------|---------------------------------------------|
| Direction of training           | 02.04.01 Mathematics and Computer Science   |
| Directionality (profile)        | Training Program for Electronic Information |
| Year of commencement of studies | 2026                                        |
| Form of study                   | full-time                                   |
| Implemented in a semester       | 2                                           |

**Developed by**

Associate Professor of the Department  
mathematical modeling, candidate of  
physical and mathematical sciences  
Ionisyan A.S.

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

The main goal of mastering the discipline "Innovative Training Practice Course (Mathematical Modeling) / Инновационный курс практического обучения (математическое моделирование)" is for each student to master a set of professional and general cultural competencies in the field of hardware development of modern high-performance computing systems.

The main objectives of studying the discipline are:

1. Review of basic microelectronic circuits.
2. Study of the Xilinx ISE 14.7 computer design environment.
3. Learning the basics of the VHDL high-speed circuit design language.
4. VHDL implementation of ordinary (binary) and modular arithmetic circuits.
5. VHDL implementation of high-performance digital signal processing circuits.
6. Optimization and synthesis of high-speed circuits.

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

The course "Innovative Training Practice Course (Mathematical Modeling) / Инновационный курс практического обучения (математическое моделирование)" refers to the part of the curriculum formed by the participants of educational relations.

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

| Code, formulation of competence                                                                                                           | Code, indicator formulation                                                                                                                                                                                                                                                                                                                                                                                                       | Planned learning outcomes for the discipline (module), characterizing the stages of formation of competencies, indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>UK-1</b><br>Able to carry out a critical analysis of problematic situations based on a systems approach and develop an action strategy | ID-1 <sub>UK-1</sub> Selects information resources for searching for information in accordance with the assigned educational task.<br>ID-2 <sub>UK-1</sub> Systematizes information obtained from various sources in accordance with the requirements for completing the educational assignment.<br>ID-3 <sub>UK-1</sub> Formulates and argues conclusions and judgments, including using the philosophical conceptual apparatus. | <b>The student will study</b> the classification of modern logic circuits, basic logic circuits of microelectronics, gates "not", "buffer", "and", "or", "exclusive or", "and-not", "or-not", multiplexers, demultiplexers, encoders, decoders, triggers, registers, counters, synthesis of universal combinational circuits based on multiplexers, synthesis of universal combinational circuits based on encoders and decoders, synchronous and asynchronous circuits, Mealy state machine, Moore state machine, addition and subtraction of binary numbers, multiplication of binary numbers, division of binary numbers, comparison of binary numbers, encoding of negative numbers in the binary number system, representation of rational numbers in the binary number system, modular arithmetic, digital filters |

| Code, formulation of competence                                                                                                       | Code, indicator formulation                                                                                                                                                                                                                                  | Planned learning outcomes for the discipline (module), characterizing the stages of formation of competencies, indicators                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PC-1</b><br>Able to demonstrate fundamental knowledge of mathematics and natural sciences, programming and information technology. | ID-1 <sub>PC-1</sub><br>In his professional activities, he demonstrates fundamental knowledge of mathematics and natural sciences.<br>ID-2 <sub>PC-1</sub> Solves problems of professional activity using programming and information technology tools       | <b>The student will be able to practice</b> and use modern methods of data processing in the field of information technology for the synthesis of very large-scale integrated circuits                                                                                                                                                                                                                                                                                                                           |
| <b>PC-2</b><br>Able to conduct scientific research based on existing methods in a specific area of professional activity.             | ID-1 <sub>PC-2</sub><br>Conducts scientific research in the field of parallel computer technologies.<br>ID-2 <sub>PC-2</sub><br>Conducts reviews of scientific articles, abstracts and dissertations in the fields of mathematics and information technology | <b>The student will study</b> the Xilinx ISE 14.7 Integrated Development Environment for Very Large-Scale Integrated Circuits, Circuit Simulation, Circuit Implementation, Circuit Flashing in FPGA, Hardware Description Language Specifics, VHDL Project Structure, VHDL Data Types, Sequential and Parallel Processes in VHDL, Implementation of Branching Constructs in VHDL, Implementation of Cyclic Constructs in VHDL, Parameterized Modules in VHDL, Signal Attributes in VHDL, Modular Design in VHDL, |
| <b>PC-3</b><br>Capable of conducting methodological and expert work in the field of mathematics and computer science.                 | ID-1 <sub>PC-3</sub><br>Conducts expert work in mathematics. ID-2 <sub>PC-3</sub><br>Conducts expert work in the field of computer science<br>ID-2 <sub>PC-3</sub><br>Prepares teaching materials in the fields of mathematics and computer science          | <b>The student will be able to</b> develop software and information support for computer systems, services, computing complexes, and databases for the synthesis of very large-scale integrated circuits .                                                                                                                                                                                                                                                                                                       |

#### 4. Volume of the academic discipline (module) and forms of control

|                                                          |                           |
|----------------------------------------------------------|---------------------------|
| Amount of classes: total: 3 credits, 108 academic hours. | OFO,<br>in academic hours |
| <b>Contact work:</b>                                     |                           |
| Lectures/including practical training                    | 0                         |
| Laboratory work /including practical training            | 0                         |
| Practical classes /including practical training          | 48                        |
| <b>Independent work</b>                                  | 60                        |
| <b>Forms of control</b>                                  |                           |

|                            |    |
|----------------------------|----|
| Exam                       | -  |
| Credit in the 2nd semester | +  |
| Credit with grade          | -  |
| Coursework                 | No |

## 5. The content of the discipline (module), structured by topics (sections) indicating the number of hours and types of classes

### 5.1 Thematic plan of the course (module)

| 1st thematic plan of the course (module) |                                                                                                                                                                                                                                                                                                                                                                                |                                      |                                                |                   |                 |                         |                      |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------------------------------|-------------------|-----------------|-------------------------|----------------------|
| No.                                      | Section (topic) of the discipline                                                                                                                                                                                                                                                                                                                                              | Implemented competencies, indicators | Contact work of students with a teacher, hours |                   |                 | Independent work, hours | Current control form |
|                                          |                                                                                                                                                                                                                                                                                                                                                                                |                                      | Lectures                                       | Practical classes | Laboratory work |                         |                      |
| 2nd semester                             |                                                                                                                                                                                                                                                                                                                                                                                |                                      |                                                |                   |                 |                         |                      |
| 1.                                       | Classification of modern electronic circuits (Overview of basic logic circuits in microelectronics, gates "not", "buffer", "and", "or", "exclusive or", "and-not", "or-not", multiplexers, demultiplexers, encoders, decoders, triggers, registers, counters, microprocessors, RAM, ROM, designations of high-level integrated circuits and basic logic on a circuit diagram ) | UK-1<br>PC-1<br>PC-2<br>PC-3         |                                                | 2.0               |                 | 3.0                     | interview            |
| 2.                                       | Classification of modern electronic circuits (Synthesis of universal combinational circuits based on encoders and decoders, Synchronous and asynchronous circuits, rising and falling edges of a signal, signal duty cycle, Mealy state machine,                                                                                                                               | UK-1<br>PC-1<br>PC-2<br>PC-3         |                                                | 2.0               |                 | 3.0                     | interview            |

|    |                                                                                                                                                                                                                                                                                                                                            |                              |  |     |  |     |           |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--|-----|--|-----|-----------|
|    | Moore state machine)                                                                                                                                                                                                                                                                                                                       |                              |  |     |  |     |           |
| 3. | Classification of modern electronic circuits ( VLSI debug boards, electronic devices and controls installed on the debug board, interaction of the debug board with the computer, additional equipment connected to the debug board )                                                                                                      | UK-1<br>PC-1<br>PC-2<br>PC-3 |  | 2.0 |  | 3.0 | interview |
| 4. | Xilinx ISE 14.7, an integrated development environment for very large-scale integrated circuits (Popular VLSI design environments, Key stages of modern VLSI design, Using IP-Core for VLSI synthesis, Creating a project, entering project source code, Circuit simulation, Circuit implementation, Test bench, Circuit firmware in FPGA) | UK-1<br>PC-1<br>PC-2<br>PC-3 |  | 2.0 |  | 3.0 | interview |
| 5. | VHDL Hardware Design Language Basics (Popular VLSI Design Languages, Specifics of the Hardware Description Language, Synthesizable and Non- Synthesizable Subsets of the VHDL Language , VHDL Project Structure, VHDL Data Types, STD-LOGIC and STD_LOGIC_VECTOR Signal Types, Signal Attributes in VHDL, IEEE VHDL Library )              | UK-1<br>PC-1<br>PC-2<br>PC-3 |  | 2.0 |  | 3.0 | interview |
| 6. | VHDL Hardware Design Language                                                                                                                                                                                                                                                                                                              | UK-1<br>PC-1                 |  | 2.0 |  | 3.0 | interview |

|     |                                                                                                                                                                                                                                                       |                              |  |     |  |     |           |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--|-----|--|-----|-----------|
|     | Fundamentals (Plug, Parallel Processes in VHDL, Implementation of Conditional and Cyclic GENERATE Constructs, WHEN Selection Constructs )                                                                                                             | PC-2<br>PC-3                 |  |     |  |     |           |
| 7.  | VHDL Hardware Design Language Basics (Sequential processes in VHDL, delta delay, process sensitivity list, signal edge detection, Implementation of sequential branch, loop and select constructs in VHDL , implementation of a finite state machine) | UK-1<br>PC-1<br>PC-2<br>PC-3 |  | 2.0 |  | 3.0 | interview |
| 8.  | VHDL Hardware Design Language Fundamentals (Modular Design in VHDL, Parameterized Modules in VHDL, Procedures and Functions in VHDL, Components, Component Declaration and Instantiation, Creating ROM and RAM in VHDL )                              | UK-1<br>PC-1<br>PC-2<br>PC-3 |  | 2.0 |  | 3.0 | interview |
| 9.  | VHDL implementation of binary arithmetic circuits (Addition and subtraction of binary numbers, encoding negative numbers in the binary number system, comparison of binary numbers)                                                                   | UK-1<br>PC-1<br>PC-2<br>PC-3 |  | 2.0 |  | 3.0 | interview |
| 10. | VHDL implementation of binary arithmetic circuits (Binary multiplication, Binary division, IP - Core functions of real                                                                                                                                | UK-1<br>PC-1<br>PC-2<br>PC-3 |  | 2.0 |  | 3.0 | interview |

|     |                                                                                                                                                                                                             |                              |  |     |  |     |           |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--|-----|--|-----|-----------|
|     | arithmetic )                                                                                                                                                                                                |                              |  |     |  |     |           |
| 11. | VHDL implementation of modular arithmetic circuits (Modular arithmetic and its extension ROC )                                                                                                              | UK-1<br>PC-1<br>PC-2<br>PC-3 |  | 2.0 |  | 3.0 | interview |
| 12. | VHDL implementation of modular arithmetic circuits (implementation of circuits for addition, subtraction, multiplication, division, comparison, conversion to and from the binary number system in the RNS) | UK-1<br>PC-1<br>PC-2<br>PC-3 |  | 2.0 |  | 3.0 | interview |
| 13. | VHDL implementation of digital signal processing circuits (Digital filters, Discrete Fourier Transform, IP - Core for digital signal processing )                                                           | UK-1<br>PC-1<br>PC-2<br>PC-3 |  | 4.0 |  | 4.0 | interview |
| 14. | VHDL implementation of digital signal processing circuits (button press processing, button debounce, LED control, PWM modulation, BCD encoding, seven-segment display )                                     | UK-1<br>PC-1<br>PC-2<br>PC-3 |  | 4.0 |  | 4.0 | interview |
| 15. | VHDL implementation of digital signal processing circuits ( I2C and UART communication interfaces of electronic devices )                                                                                   | UK-1<br>PC-1<br>PC-2<br>PC-3 |  | 4.0 |  | 4.0 | interview |
| 16. | Optimization of energy consumption and synthesis of high-speed circuits                                                                                                                                     | UK-1<br>PC-1<br>PC-2<br>PC-3 |  | 4.0 |  | 4.0 | interview |

|     |                                                                                                                                                                                         |                              |  |           |  |           |           |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--|-----------|--|-----------|-----------|
|     | (Determination of energy consumption of the designed VLSI, IP - Core clock generator, IP - Core ROM and RAM, IP - Core "Stack" and "Queue" structures)                                  |                              |  |           |  |           |           |
| 17. | optimization and high-speed circuit synthesis ( VGA frame generation, simple video adapter and digital camera controller, character generator, IP - Core for video quality improvement) | UK-1<br>PC-1<br>PC-2<br>PC-3 |  | 4.0       |  | 4.0       | interview |
| 18. | Power optimization and high-speed circuit synthesis ( SDRAM controller, DDR controller, simple microprocessor, microprocessor IP - Core )                                               | UK-1<br>PC-1<br>PC-2<br>PC-3 |  | 4.0       |  | 4.0       | interview |
|     | TOTAL for 2nd semester                                                                                                                                                                  |                              |  | <b>48</b> |  | <b>60</b> |           |
|     | TOTAL                                                                                                                                                                                   |                              |  | <b>48</b> |  | <b>60</b> |           |

#### **6. Fund of assessment tools for conducting ongoing monitoring of academic performance and midterm assessment of students in a discipline (module)**

The assessment toolkit (AST) for ongoing monitoring of student progress and midterm assessment in a course is based on a list of competencies being mastered, indicating the stages of their development during the course (module) mastery. The AST provides objective monitoring of the achievement of planned learning outcomes. The AST includes:

- description of indicators and criteria for assessing competencies at various stages of their formation, description of assessment scales;
- methodological materials defining the procedures for assessing knowledge, skills, abilities and (or) work experience, characterizing the stages of competence development;
- standard test assignments and other materials necessary for assessing knowledge, skills and the level of mastery of the developed competencies in the process of mastering the discipline (module).

FOS is an appendix to this discipline (module) program.

#### **7. Methodological guidelines for students on mastering the discipline**

When starting work, each student should take into account the following provisions.

The discipline (module) is structured on a thematic principle, each topic is a logically complete section.

Practical classes are conducted with the aim of consolidating the acquired information and acquiring skills for its application in solving practical problems in the relevant subject area .

Students' independent work is aimed at independent study of additional material, preparation for practical and laboratory classes, and completion of all types of independent work.

To successfully master the discipline, it is necessary complete all types of independent work using the recommended sources of information.

## **8. Educational, methodological and informational support of the discipline**

8.1. List of basic and additional literature required for mastering the discipline (module)

8.1.1. List of main literature:

1. GOST R 50754-95. VHDL Digital Systems Hardware Description Language. Language Description. Moscow: Gosstandart of Russia, 1995.
2. Bibilo P.N. Fundamentals of the VHDL language. 3rd ed., suppl. - M.: LKI Publishing House, 2014.
3. Harris, D.M. and Harris, S.L. Digital Circuit Design and Computer Architecture. Moscow: Morgan Kaufman, 2013.
4. B. Parhami, Computer Arithmetic: Algorithms and Hardware Designs, 2nd edition, Oxford University Press, New York, 2010.

8.1.2. List of additional literature:

1. Akushsky I.Ya., Yuditsky D.I. Machine arithmetic in residual classes. – M.: Soviet Radio, 1968.
2. Modular parallel computing structures of neuroprocessor systems / N. I. Chervyakov, P. A. Sakhnyuk, A. V. Shaposhnikov, S. A. Ryadnov; Ed. N. I. Chervyakov. - M.: FIZMATLIT, 2003.
3. Xilinx FPGAs in the WebPACKISE environment / compiled by G.V. Malinin, S.V. Abramov, A.V. Serebryannikov. Cheboksary: Publishing house of Chuvashia University, 2013.
4. Tanenbaum E. Computer Architecture. 5th ed. - St. Petersburg: Piter, 2007.
5. Amos Omondi, Benjamin Premkumar. Residue Number System. Theory and implementation. - London: Imperial College Press, 2007.

8.1.3. List of educational and methodological support for independent work of students in a discipline (module)

1. Bibilo P.N. Fundamentals of the VHDL language. 3rd ed., suppl. - M.: LKI Publishing House, 2014.
2. Harris, D.M. and Harris, S.L. Digital Circuit Design and Computer Architecture. Moscow: Morgan Kaufman, 2013.

8.1.4. List of resources of the information and telecommunications network "Internet" required for mastering the discipline (module)

1. Electronic library "Wikipedia" [electronic resource] / <http://www.wikipedia.org>
2. Official website of Xilinx [electronic resource] / <http://www.xilinx.com>

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

Lectures are delivered using computers and multimedia presentations. During seminars and practical classes, students present presentations they prepared during their independent work hours.

Information reference systems:

Information and reference and information and legal systems used in the study of the discipline:

- |   |                                                                                                              |
|---|--------------------------------------------------------------------------------------------------------------|
| 1 | Official website of Xilinx [electronic resource] / <a href="http://www.xilinx.com">http://www.xilinx.com</a> |
|---|--------------------------------------------------------------------------------------------------------------|

|   |                                                                                                                                                                     |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 | <a href="https://www.ncfu.ru/science/elektronnye-resursy/ebs/">https://www.ncfu.ru/science/elektronnye-resursy/ebs/</a> - Electronic library systems (ELS) of NCFU. |
| 3 | <a href="http://catalog.ncfu.ru/catalog/ncfu">http://catalog.ncfu.ru/catalog/ncfu</a> - Search in the electronic catalog of the scientific library of NCFU          |
| 4 | <a href="http://www.yandex.ru">www.yandex.ru</a> - Yandex search engine                                                                                             |

Software:

|   |                                   |
|---|-----------------------------------|
| 1 | Alt Workstation 10                |
| 2 | Alt Workstation K                 |
| 3 | Alt "Server"                      |
| 4 | Office suite programs - P7-Office |

## **10. Description of the material and technical base necessary for the implementation of the educational process in the discipline (module)**

Classrooms for conducting classes are equipped with equipment and teaching aids. Rooms for independent student work are equipped with computers and internet connections, providing access to an online information and educational environment. Specialized furniture and teaching aids are also available for presenting educational information.

The material and technical base ensures the implementation of all types of disciplinary and interdisciplinary training, laboratory, and research work of students (portable laptop, portable projector, computers with the necessary software and Internet access).

The rooms for independent student work are equipped with computers with the ability to connect to the Internet and provide access to the educational institution's electronic information and educational environment.

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

Students with disabilities are provided with special textbooks, teaching aids and didactic materials, special technical teaching aids for collective and individual use, the services of an assistant (helper) who provides students with the necessary technical assistance, as well as the services of sign language interpreters and tactile sign language interpreters.

The acquisition of a discipline (module) by students with disabilities can be organized jointly with other students, as well as in separate groups.

The acquisition of a discipline (module) by students with disabilities is carried out taking into account the characteristics of psychophysical development, individual capabilities and health status.

In order to ensure accessibility of higher education under the educational program for individuals with disabilities, the following is provided when mastering a discipline (module):

1) for persons with visual impairments:

- the presence of an assistant who provides the student with the necessary technical assistance, taking into account individual characteristics (helps to take up a workstation, move around, read and complete assignments, including taking down dictation),
- written assignments, as well as instructions on how to complete them, are written in large print,
- special textbooks, teaching aids and didactic materials (with large print or audio files),
- individual uniform illumination of at least 300 lux,
- if necessary, the student is provided with a magnifying device to complete the assignment;

2) for persons with hearing impairments:

- the presence of an assistant who provides the student with the necessary technical assistance, taking into account individual characteristics (helps to take up a workstation, move around, read and complete assignments, including taking down dictation),
- the availability of sound amplification equipment for collective use is ensured; if necessary, the student is provided with sound amplification equipment for individual use;
- is provided with appropriate sound means for reproducing information;

- 3) for persons with disabilities who have musculoskeletal disorders (including severe impairments of the motor functions of the upper limbs or the absence of upper limbs):
- written assignments are completed on a computer with specialized software or dictated to an assistant;

## **12. Features of the implementation of the discipline using distance learning technologies and e-learning**

According to Part 1 of Article 16 of Federal Law No. 273-FZ of December 29, 2012, "On Education in the Russian Federation," *e-learning* is defined as the organization of educational activities using information contained in databases and used in the implementation of educational programs, as well as information technologies, technical means, and information and telecommunications networks that facilitate the transmission of said information over communication lines, as well as interaction between students and teaching staff. *Distance learning technologies* are educational technologies implemented primarily using information and telecommunications networks through indirect (remote) interaction between students and teaching staff.

The course may be delivered using distance learning technologies and e-learning, in whole or in part. The components of the course's teaching and methodological kit (the course curriculum, assessment and methodological materials, and assessment forms) implemented using distance learning technologies and e-learning contain instructions for their use.

When organizing educational activities using distance learning technologies and e-learning, asynchronous and synchronous methods of interaction between participants in educational relations may be provided through the Internet information and telecommunications network.

When using distance learning technologies and e-learning, the curriculum for the discipline shall indicate: methods of interaction between participants in educational relations via the Internet (videoconferencing, electronic testing); links to the SKFU electronic information and educational environment, to educational platforms and resources of other organizations that are openly accessible via the Internet; for synchronous learning - the time of online classes and teachers; for asynchronous learning - the authors of online courses.

When organizing midterm assessments using distance learning technologies and e-learning, the Methodological Recommendations for the Use of Technical Means Ensuring the Objectivity of Results during Midterm and State Final Assessments for Higher Education Programs—Bachelor's Degree Programs, Specialist Programs, and Master's Degree Programs Using Distance Learning Technologies—are used (Letter of the Ministry of Education and Science of Russia dated December 7, 2020, No. MN-19/1573-AN "On the Submission of Methodological Recommendations").

The implementation of the discipline with the use of e-learning and distance learning technologies is carried out using the electronic information and educational environment of SKFU, to which students have access via the information and telecommunications network "Internet", or using the resources of other organizations, including platforms that provide services for video conferencing, online meetings and distance learning (MTS-Link), as well as using the capabilities of social networks for communication between students and teachers .

The educational and methodological support for a discipline implemented using e-learning and distance learning technologies includes a work program, educational and methodological manuals or a course of lectures, methodological instructions for the implementation of various types of educational activities of students provided for by the discipline, and other educational and methodological materials posted in the information and educational environment of SKFU, presented in electronic form.