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MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION
Federal State Autonomous Educational Institution
higher education
NORTH CAUCASIAN FEDERAL UNIVERSITY

I APPROVED BY
Acting director of the institute
advanced engineering
Ph.D. tech. Sciences , Associate Professor
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WORKING PROGRAM OF THE DISCIPLINE
"Physics I/College Physics I"

Direction of training	11.03.02 Infocommunication technologies and communication systems
Profile	Intelligent Data Processing in Infocommunication Systems and Networks
Year of commencement of studies	2026
Form of study	full-time
Implemented in a semester	2 and 3

Developed by
Professor of the Department of Experimental Physics
Faculty of Physics and Technology
Doctor of Physical and Mathematical Sciences, Associate Professor
Martens V.Ya.

1. The purpose and objectives of mastering the discipline

The goal of mastering the physics course is to promote the development of students' physical thinking, the formation of a unified, logically consistent physical picture of the world, the formation of a scientific worldview, and the laying of a foundation for the study of specialized disciplines.

The main objective of teaching this discipline is to master techniques and methods for solving specific problems from various areas of physics, to develop skills in conducting physical experiments and processing experimental results.

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

The discipline " Physics I/College Physics I " is a compulsory discipline.

3. A list of planned learning outcomes for the discipline, 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
Able to use the principles, laws and methods of natural sciences and mathematics to solve engineering problems (OPK-1)	ID-1 OPK-1 Understands the fundamental laws of nature and the basic physical and mathematical laws and methods of accumulation, transmission and processing of information	Understands the fundamental laws of nature and basic physical laws.
	ID- 2 OPK-1 Applies physical laws and mathematical methods to solve theoretical and applied problems .	Applies physical laws to solve theoretical and applied problems.
	ID-3 OPK-1 Uses knowledge of physics and mathematics when solving practical problems.	Uses knowledge of physics to solve practical problems.
Able to independently conduct experimental research and use basic techniques for processing and presenting the obtained data (OPK-2)	ID-1 OPK- 2 Finds and critically analyzes the information necessary to solve the assigned problem.	Finds and critically analyzes information needed to solve a given physics problem.
	ID- 2 OPK- 2 Develops a solution to a specific problem, choosing the optimal option and evaluating its advantages and disadvantages.	Develops a solution to a specific physical problem, choosing the optimal option and evaluating its advantages and disadvantages.
	ID- 3 OPK- 2 Understands the basic methods and means of conducting experimental research, standardization and certification systems.	Understands the basic methods and tools for conducting experimental research
	ID-4 OPK-2 Selects methods and means of measurement and conducts experimental research.	Selects methods and means of measurement and conducts experimental research.
	ID- 5 OPK- 2 Proficient in methods of processing and presenting obtained data and assessing the error of measurement results.	Proficient in methods of processing and presenting obtained data and assessing the error of measurement results.

4. Volume of academic discipline and forms of control

Amount of classes: total: 7 credits, 252 academic hours.	OFO, In academic hours
Contact work:	96.00/0
Lectures/including practical training	0
Laboratory work /including practical training	0
Practical classes /including practical training	96.00/0
Independent work	156.00
Forms of control	
Exam	-
Credit	Yes
Credit with grade	-
Coursework	No

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

No.	Section (topic) of the discipline and brief content	Developed competencies, indicators	full-time education				Forms of the current control academic performance
			Contact work of students with a teacher/of which in the form of practical training, hours			Independent work, hours	
			Lectures	Practical classes	Laboratory work		
2nd semester							
1	1. Physical foundations of mechanics 1.1 Elements of kinematics Mechanical motion. Physical models: particle, rigid body, continuous medium. Concept of state in classical mechanics. Trajectory, path, displacement. Velocity and acceleration of a particle. Kinematic equations of motion of a particle. Rigid body kinematics. Angular path, angular acceleration. Kinematic equations of motion of a rigid body. Practical work No. 1 Mechanics of translational and rotational motion	OPK-1 ID-1 OPK-1 ID-2 2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 ID-5 OPK-2		2		8	interview
2	1.2 Particle Dynamics Newton's laws. Inertial reference frames. Momentum. Law of conservation of momentum. Practical work #2	OPK-1 ID-1 OPK-1 ID-2 2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 2 OPK-2 ID-3		2		8	

	Conservation laws in mechanics	OPK-2 ID-4 OPK-2 ID-5 OPK-2					
3	1.3 Work. Energy. Law of conservation of energy Work and kinetic energy. Power. Conservative and non-conservative forces. Potential energy. Law of conservation of energy in mechanics. Practical work #3 Basic concepts of molecular kinetic theory	OPK-1 ID-1 OPK-1 ID-2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 ID-5 OPK-2		2		8	
4	1.4 Dynamics of a rigid body Moment of force. Moment of inertia of a body. Angular momentum. Law of conservation of angular momentum. Equations of motion and equilibrium of rigid bodies. Kinetic energy of a body rotating around a fixed axis. Practical work #4 Ideal gas	OPK-1 ID-1 OPK-1 ID-2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 ID-5 OPK-2		2		8	
5	1.5 Mechanical vibrations and waves Harmonic oscillation equation. Oscillations under the action of quasi-elastic forces. Physical and mathematical pendulums. Free damped oscillations. Damping coefficient, logarithmic decrement, quality factor. Forced oscillations of an oscillator. Resonance. Elastic waves. Practical work #5 Transfer phenomena	OPK-1 ID-1 OPK-1 ID-2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 ID-5 OPK-2		4		8	
6	2. Electricity . 2.1 Electric field in a vacuum Electric charge. Electric field strength. Superposition principle. Electric field strength vector flux. Gauss's theorem. Electrostatic field work. Circulation. Potential. Relationship between potential and field strength . Practical work #6 Fundamentals of Thermodynamics	OPK-1 ID-1 OPK-1 ID-2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 ID-5 OPK-2		4		8	
7	2.2 Dielectrics and conductors in an electric field Types of dielectrics. Polarization charges. Polarization. Field strength in dielectrics. Ferroelectrics. Conductor in an electric field. Electrostatic induction. Electrical capacitance. Capacitors. Capacitor energy. Electrostatic field energy. Practical work #7	OPK-1 ID-1 OPK-1 ID-2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 ID-5 OPK-2		4		6	

8	2.3 Laws of direct current Electric current. Conditions for the existence of electric current. External forces. EMF of a galvanic cell. Ohm's and Joule-Lenz's laws. Kirchhoff's rules. Practical work #8 Electrostatics	OPK-1 ID-1 OPK-1 ID-2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 ID-5 OPK-2		4		6	interview
9	3. Magnetism 3.1 Magnetic field of a current-carrying conductor Magnetic induction vector. Superposition principle. Biot-Savart-Laplace law. Magnetic field of simple systems. Circulation of the magnetic induction vector in a closed loop. Magnetic field of a solenoid. Practical work #9 Direct electric current	OPK-1 ID-1 OPK-1 ID-2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 ID-5 OPK-2		4		6	interview
10	3.2 Forces in a magnetic field The effect of a magnetic field on a current-carrying conductor. Ampere force. A current-carrying loop in a magnetic field. The Lorentz force. The motion of a charged particle in electric and magnetic fields. Practical work #10 Electric current in various environments	OPK-1 ID-1 OPK-1 ID-2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 ID-5 OPK-2		4		6	interview
11	3.3 Electromagnetic induction The phenomenon of electromagnetic induction. Lenz's law. The phenomenon of self-induction. Mutual induction. The establishment and disappearance of current in a circuit. Magnetic field energy. Magnetic energy density. Practical work #11 Electromagnetism	OPK-1 ID-1 OPK-1 ID-2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 ID-5 OPK-2		4		6	interview
12	3.4 Magnetic properties of matter Magnetic moments of atoms. Atom in a magnetic field. Diamagnetism. Paramagnetism. Magnetization. Total current law for the magnetic field in matter. Ferromagnetism. Domain structure. Technical magnetization curve. Practical work #12	OPK-1 ID-1 OPK-1 ID-2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 ID-5 OPK-2		4		6	interview
13	3.5 Maxwell's Equations Eddy electric field. Displacement current. Maxwell's system of equations in integral form.	OPK-1 ID-1 OPK-1 ID-2 OPK-1 ID-3 OPK-1 OPK-2		4		6	interview

	Practical work #13 Electromagnetic induction	ID-1 OPK-2 ID-2 2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 2 ID-5 OPK-2					
14	3.6 Electromagnetic oscillations and waves. Free oscillations in an ideal oscillatory circuit. Damped oscillations. Forced oscillations in an oscillatory circuit. Resonance. Electromagnetic waves. Practical work #14 Magnetic properties of matter	OPK-1 ID-1 OPK-1 ID-2 2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 2 ID-5 OPK-2		4		6	interview
	TOTAL for 2nd semester			48.00		96.00	
3rd semester							
15	4. Optics 4.1 Interference of light waves Coherence. Calculation of interference patterns from two sources. Interference of light reflected from a plane-parallel transparent plate. Antireflection coating of optical systems. Practical work #15 Maxwell's theory and electromagnetic waves	OPK-1 ID-1 OPK-1 ID-2 2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 2 ID-5 OPK-2		6		6	interview
16	4.2 Diffraction and polarization of light Huygens-Fresnel principle. Fresnel zone method. Fresnel diffraction. Fraunhofer diffraction. Diffraction grating. The physical nature of the polarization process. Malusse's law. Polarization upon reflection from a dielectric. Brewster's law. Practical work #16 Laws of geometric optics	OPK-1 ID-1 OPK-1 ID-2 2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 ID-5 OPK-2		6		6	interview
17	5. Quantum Physics 5.1 Thermal radiation Thermal equilibrium radiation and its laws. Characteristics of thermal radiation of a blackbody. Rayleigh-Jeans formula. Planck formula . Practical work #17 Basic laws of light propagation	OPK-1 ID-1 OPK-1 ID-2 2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 2 ID-5 OPK-2		6		8	interview
18	5.2 Quantum optical phenomena The photoelectric effect. Laws and quantum theory of the external photoelectric effect. Photon energy and momentum. Light pressure. The Compton effect.	OPK-1 ID-1 OPK-1 ID-2 2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 2 OPK-2 ID-3		6		8	interview

	Practical work #18 Interference of light	OPK-2 ID-4 OPK-2 ID-5 OPK-2					
19	5.3 Bohr's theory of the hydrogen atom Line spectra of atoms. Bohr's theory of the hydrogen atom. Franck and Hertz's experiments. Practical work #19 Polarization of light	OPK-1 ID-1 OPK-1 ID-2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 ID-5 OPK-2		6		8	interview
20	5.4 Wave-corpuscule duality De Broglie's hypothesis. Electron diffraction. Neutron diffraction. Uncertainty principle. Practical work #20 Wave properties of matter	OPK-1 ID-1 OPK-1 ID-2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 ID-5 OPK-2		6		8	interview
21	6. Elements of solid state physics 6.1 Quantum statistics Statistical description of a quantum system. Bose and Fermi distributions. Degenerate particle systems. Degenerate electron gas in metals. Practical work #21 Models of atomic structure	OPK-1 ID-1 OPK-1 ID-2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 ID-5 OPK-2		6		8	interview
22	6.2 Electrical conductivity of solids Band structure of the electron energy spectrum. Fermi level. Band filling: metals, semiconductors, dielectrics. Intrinsic and extrinsic conductivity of semiconductors. Photoconductivity. Contact phenomena. p - n junction. Practical work #22 Structure and spectra of atoms	OPK-1 ID-1 OPK-1 ID-2 OPK-1 ID-3 OPK-1 OPK-2 ID-1 OPK-2 ID-2 OPK-2 ID-3 OPK-2 ID-4 OPK-2 ID-5 OPK-2		6		8	interview
	TOTAL for the 3rd semester			48.00		60.00	
	TOTAL			96.00		156.00	

6. Fund of assessment tools for conducting ongoing monitoring of academic performance and midterm assessment of students in the discipline

The Assessment Toolkit (AT) for ongoing performance monitoring and midterm assessment of students in the course "Physics I/College Physics I" is based on a list of mastered competencies and the stages of their development during the course. The AT provides objective monitoring of the achievement of planned learning outcomes. The AT 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 competencies being developed in the process of mastering the discipline.

FOS is an appendix to this discipline program.

7. Methodological guidelines for students on mastering the discipline

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

The discipline is structured on a thematic principle, with each topic representing a logically complete section.

The lecture material is devoted to the examination of key, basic provisions of the courses and an explanation of the educational assignments assigned to students for independent work.

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

Laboratory work is aimed at acquiring practical experience in the relevant subject area.

Students' independent work is aimed at independent study of additional material, preparation for 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

8.1.1. List of main literature:

1. Saveliev I.V. General Physics Course: [textbook]: in 3 volumes. /I.V. Saveliev; edited by I.V. Saveliev, Volume 1. Mechanics. Molecular Physics and Thermodynamics. Moscow: Lan 2022. – 472 p. ISBN 978-5-8114-9890-1

2. Saveliev I.V. General Physics Course: [textbook]: in 3 volumes. /I.V. Saveliev; edited by I.V. Saveliev, Volume 2. Electricity and Magnetism. Waves. Optics. Moscow: Lan 2022. – 500 p. ISBN 978-5-8114-8926-8

3. Saveliev I.V. General Physics Course: [textbook]: in 3 volumes. /I.V. Saveliev; edited by I.V. Saveliev, Volume 3. Quantum Optics. Atomic Physics. Solid State Physics. Physics of the Atomic Nucleus and Elementary Particles St. Petersburg: Lan SpB 2019. – 450 p. ISBN 978-5-8114-4598-1

8.1.2. List of additional literature:

1. 1. Trofimova, T. I. Physics course: textbook / T. I. Trofimova. – 17th ed., erased. - M.: ACADEMIA, 2008. - 560 p.: ill., table. – (Higher professional education). – ISBN 978-5-7695-5782-8.

2. 2. Dmitrieva, V. F. Fundamentals of physics: textbook. manual / V. F. Dmitrieva, V. L. Prokofiev. – Izd.2-e, espr. and additional. - M.: Higher school, 2001. - 527 p.: ill. – Vulture: Supplement. MO. – Add.: p. 500-506. – Predm. decree: p. 510-519. – ISBN 5-06-003790-8.

3. Tashlykova-Bushkevich I.I. Physics. Part 1. Mechanics. Molecular Physics and Thermodynamics. Electricity and Magnetism [Electronic resource]: textbook / I.I. Tashlykova-Bushkevich . - Electronic text data. - Minsk: Higher School, 2014. - 304 p. - 978-985-06-2505-2. - Access mode: <http://www.iprbookshop.ru/35562.html>

4. Tashlykova-Bushkevich I.I. Physics. Part 2. Optics. Quantum Physics. Structure and Physical Properties of Matter [Electronic resource]: textbook / I.I. Tashlykova-Bushkevich . - Electronic text data. - Minsk: Higher School, 2014. - 232 p. - 978-985-06-2506-9. - Access mode: <http://www.iprbookshop.ru/35563.html>

8.2. List of educational and methodological support for independent work of students in the discipline

1. Guidelines for laboratory classes in the discipline "Physics"

2. Methodological recommendations for independent work in the discipline "Physics".

8.3. List of resources of the information and telecommunications network "Internet" necessary for mastering the discipline

1 <http://demo.home.nov.ru> – The world of physics: physical experiment;

2 <http://experiment.edu.ru> – natural science experiments - Physics: Collection of the Russian general education portal;

- 3 <http://fizkaf.narod.ru> – Department and Laboratory of Physics of the Moscow Institute of Open Education;
- 4 <http://genphys.phys.msu.ru> – website of the Department of General Physics of the Physics Faculty of Moscow State University.
- 5 <http://www.edu.delfa.net> – physics department of the St. Petersburg Academy of Postgraduate Pedagogical Education;
- 6 <http://www.phys.spb.ru> – website of the Physics Department of St. Petersburg State University;
- 7 <http://genphys.phys.msu.ru/rus/edu/mech.php>
- 8 <https://ocw.mit.edu/courses/physics/8-01-classical-mechanics-fall-2016/>

9. List of information technologies used in the implementation of the educational process in the discipline, 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. <http://fizkaf.narod.ru> – Department and Laboratory of Physics of the Moscow Institute of Open Education;
2. <http://www.phys.spb.ru> – website of the Physics Department of St. Petersburg State University;
3. <http://experiment.edu.ru> – natural science experiments - Physics: Collection of the Russian general education portal;
4. <http://www.edu.delfa.net> – physics department of the St. Petersburg Academy of Postgraduate Pedagogical Education;
5. <http://genphys.phys.msu.ru> – website of the Department of General Physics of the Physics Faculty of Moscow State University.
6. <http://demo.home.nov.ru> – The world of physics: physical experiment;

Software:

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

10. Description of the material and technical base necessary for the implementation of the educational process in the discipline

Lecture classes	The lecture hall is equipped with specialized furniture and technical teaching aids for presenting educational information to a large audience, including a laptop and a projector. Visual aids include topical presentations corresponding to the course syllabi.
Laboratory classes	Laboratory setup "Earth's Magnetic Field" Laboratory setup "Magnetic field of coils/study of the Biot-Savart law" Installation "Study of temperature dependence of various resistors P241040" Installation "Malus' Law" R2250400 Michelson Interferometer R2220500 Centrifugal Force Unit P2131660 Faraday Effect Installation P2260100 Training complex AKIP-9501

	Training complex AKIP-9503 Educational laboratory complex "Electric magnetism"
Practical classes	The classroom for seminar-type classes is equipped with specialized furniture and technical teaching aids for presenting educational information, including a projector and interactive whiteboard. Internet access is available, as is access to the university's educational network.
Independent work	A room for independent student work, equipped with computers and internet access, providing access to an electronic information and educational environment.
Practical training	It is carried out in the structural divisions of the university and (or) in organizations operating in the profile of the relevant educational program, including its structural division

11. Features of mastering the discipline 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 the discipline by students with disabilities can be organized jointly with other students, as well as in separate groups.

The acquisition of the discipline 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 the discipline:

- 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;
 - at the student's request, assignments can be completed orally.

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 activ-

ities 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 Application 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 the Russian Federation dated December 7, 2020, No. MN-19/1573-AN "On the Submission of Methodological Recommendations").

The implementation of the course using 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 providing 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.