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MINISTRY OF SCIENCE AND HIGHER EDUCATION

RUSSIAN FEDERATION

Federal State Autonomous Educational Institution of Higher Education

NORTH-CAUCASUS FEDERAL UNIVERSITY

APPROVED

Assoc. Prof. Kubanov S.I.

PhD in Medical Sciences

Dean

Faculty of Medicine and Biology

COURSE OUTLINE OF THE DISCIPLINE (MODULE)

Pharmacology

Name of the discipline (module)

- Specialty: 31.05.01 General Medicine
- Mode of training: Full-time
- Year of commencement of studies: 2026
- Delivered in Semester 5-6

Developed by:

Associate Professor of the Department of Pharmacology

position

Anenko Denis Stanislavovich

full name

Stavropol 2026

1. Aim and Objectives of Mastering the Discipline (Module)

- Aim of mastering the discipline Pharmacology to develop systematic knowledge, professional and general scientific competencies of future specialists in the programme 31.05.01 General Medicine concerning the use of medicinal products, their classification into pharmacotherapeutic groups, indications and contraindications for use, interchangeability of medicinal products and principles of rational administration; to form the ability and readiness to provide information and consultative services regarding the use and compatibility of medicinal products (MPs).
- Objectives of mastering the discipline Pharmacology:

to cultivate proficiency in working with diverse reference literature in pharmacology, product monographs, and the ability to navigate medical handbooks by nosology;

to develop professional competences in synthesising information on established and novel medicinal products, as well as data on pharmacoprophylaxis and pharmacotherapy of specific diseases.

2. Place of the Discipline (Module) in the Structure of the Training (educational) Program

The discipline Pharmacology belongs to the compulsory part.

3. List of Potential Learning Outcomes for the Discipline (Module), Correlated with the Outcomes of Mastering the Educational Program

Code and definition of the competence	Code and definition of the indicator	Planned learning outcomes for the discipline (module) describing the stages of competency and indicator development
Ready for the management and treatment of patients with various nosological forms in outpatient conditions and day-care hospital conditions.	AI-1 PC-5: Prescribes medicinal drugs, medical devices, and medical nutrition, taking into account the diagnosis, age, and clinical picture of the disease in accordance with current procedures for rendering medical care, clinical recommendations (treatment protocols) on issues of medical care provision, taking into account healthcare standards.	Acquisition of special medical skills and their application in practical healthcare
	AI-2 PC-5: Evaluates the efficacy and safety of the use of medicinal drugs, medical devices, medical nutrition, and non-medicinal treatment.	
	AI-3 PC-5: Plans and monitors the management of patients with various	

	nosological forms in outpatient conditions and day-care hospital conditions.	
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4. Volume of the Academic Discipline (Module) and Control *

Volume of classes: Total: 6 ECTS credits, 216 academic hours.	Full-time type of study, in academic hours
Face-to-face work	102
Lectures / including practical training	34
Practical classes / including practical training	68
Independent work	114
Forms of control	
Credit (Pass/Fail)	
Graded credit (Graded Pass/Fail test)	

* The discipline (module) provides for the use of e-learning and remote learning technologies (unless otherwise set by the educational standard).

5. Content of the Discipline (Module), Structured by Topics (Sections) with an Indication of the Hours and Types of Classes

#	Section (topic) of the discipline and brief content	Competencies and indicators to be developed	Full-time training			Forms of current control of academic progress	
			Contact work of students with the teacher / of them practical skills training, hours				Independent work, hours
			Lectures	Practical classes	Laboratory work		

1	Introduction to the pharmacology course. Pharmacological classification of medicinal products. The medical prescription. Pharmacokinetics of medicinal substances.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5	2	6			Testing
2	Pharmacodynamics of medicinal products. Routes of administration. The movement of medicinal substances in the organism. Principles of pharmacogenetics. Dosing, combination and repeated administration of medicinal products.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5	2	6			Testing
3	Continuation of pharmacodynamics; routes of administration; pharmacokinetics; pharmacogenetics; dosing and combined administration.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5	2	6			Testing
4	Agents acting on cholinergic and adrenergic synapses.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5	4	6			Testing
5	Agents for local anaesthesia.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5	4	6			Testing
6	Agents for general anaesthesia.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5	4	6			Testing
	TOTAL in Semester 5		18	36		54	

7	Analgesics. Hypnotics. Anticonvulsants and antiparkinsonian agents.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5		4			Testing
8	Agents regulating mental activity (psychotropic agents). Psychostimulants. Antidepressants. Nootropics, adaptogens, actoprotectors. Analeptics.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5	2	4			Testing
9	Antihypertensive and hypertensive agents. Cardiotonics. Cardiac glycosides. Antiarrhythmic agents.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5		4			Testing
10	Hypolipidaemic and endotheliotropic agents. Antianginal and anti-ischaemic agents.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5	2	4			Testing
11	Drugs affecting respiratory system function. Diuretics.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5		2			Testing
12	Agents affecting myometrial tone and activity.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5	2	2			Testing

13	Agents influencing platelet aggregation, coagulation and fibrinolysis. Agents regulating haematopoiesis. Vitamin preparations. Coenzymes. Membrane stabilisers, antihypoxants, radioprotectors.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5		2			Testing
14	Hypothalamic, pituitary and pineal hormones. Thyroid, parathyroid and pancreatic hormone preparations.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5	2	2			Testing
15	Adrenal hormones, sex hormones. Anabolic steroids. Antihormonal agents. Modern contraceptives.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5	2	2			Testing
16	Agents modulating immune processes.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5	2	2			Testing
17	Antimicrobial and antiparasitic agents. Principal classes of chemotherapeutic and chemoprophylactic agents for infectious diseases. Antiseptics and disinfectants. Antibiotics.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5		2			Testing

18	Sulfonamides, nitrofurans, derivatives, 8-oxyquinolones and other compounds. Antitubercular and antisyphilitic agents. Agents for prevention and treatment of protozoal infections.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5	2	2			Testing
19	Antiviral agents. Antifungal agents. Anthelmintics. Antineoplastic agents.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5		2			Testing
20	Key aspects of chronopharmacology. The role of chronopharmacology in improving efficacy and safety of medicinal products. Principles of treating acute poisoning. Plasma-substituting and detoxification agents.	AI-1 PC-5 AI -2 PC-5 AI -3 PC-5	2	2			Testing
	TOTAL in Semester 6		16	32		60	
	TOTAL		34	68		114	

6. Assessment Tools Fund for the Discipline (Module)

The assessment tools fund (ATF) for the discipline (module) Pharmacology is based on the list of competencies to be mastered, indicating the stages of their formation in the process of mastering the discipline (module). The ATF provides an objective control over the achievement of the planned learning outcomes. The ATF includes:

- A description of indicators and criteria for evaluating competencies at various stages of their formation, a description of evaluation scales;
- Methodological materials determining the procedures for evaluating knowledge, skills, abilities and (or) work experience characterizing the stages of competency formation;
- Standard control tasks and other materials necessary for assessing knowledge, skills, and the level of mastery of the formed competencies in the process of mastering the discipline (module).

The ATF is an appendix to this discipline (module) program.

7. Methodological Guidelines for Students on Mastering the Discipline

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

The discipline (module) is structured on a thematic principle; each topic represents a logically completed section.

The lecture material is dedicated to the consideration of key, basic provisions of the courses and the clarification of learning tasks assigned for the independent work of students.

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

Laboratory works are aimed at gaining practical experience in the relevant subject area.

The independent work of students is aimed at the independent study of additional material, preparation for practical and laboratory classes, as well as the execution of all types of independent work.

In order to successfully master the discipline, it is important to complete all types of independent work employing the recommended sources of information.

8. Educational, Methodological, and Informational Support for the Discipline

8.1. List of Main and Additional Literature Required for Mastering the Discipline (Module)

8.1.1. List of Main Literature:

1. Sokolov V.D. Pharmacology: textbook / V.D. Sokolov. 4th ed., rev. and enlarged. St Petersburg: Lan, 2022. 576 pp. ISBN 978-5-8114-0901-3. (Electronic text via Lan e-library: <https://e.lanbook.com/book/211262>)
2. Pharmacology: textbook / ed. R.N. Alyautdin. 6th ed., rev. and enlarged. Moscow: GEOTAR-Media, 2022. 1104 pp. ISBN 978-5-9704-6819-7. (Electronic text via Student Library e-resources: <https://www.studentlibrary.ru/book/ISBN9785970468197>)
3. Kharkevich D.A. Pharmacology: textbook / D.A. Kharkevich. 13th ed., rev. Moscow: GEOTAR-Media, 2022. 752 pp. ISBN 978-5-9704-6820-3. (Electronic text via Student Library: <https://www.studentlibrary.ru/book/ISBN9785970468203>)

8.1.2. List of Additional Literature:

1. Alyautdin R.N. Pharmacology: textbook / R.N. Alyautdin, N.G. Preferansky. Moscow: GEOTAR-Media, 2020. 688 pp. ISBN 978-5-9704-5598-2. (Electronic: Student Library)
2. Alyautdin R.N. Pharmacology: textbook / ed. R.N. Alyautdin. 4th ed., rev. and enlarged. 2008. 832 pp. ISBN 978-5-9704-0710-3. (Electronic: Student Library)
3. Andreeva N.L., Nozdrin G.A. Pharmacology / N.L. Andreeva, G.A. Nozdrin; ed. V.D. Sokolov. 5th ed. St Petersburg: Lan, 2022. 576 pp. ISBN 978-5-8114-9778-2. (Electronic: Lan e-library)
4. Vengerovsky A.I. Pharmacology: textbook. Moscow: GEOTAR-Media, 2022. 848 pp. ISBN 978-5-9704-6722-0. (Electronic: Student Library)
5. Pharmacology: practical manual for classes / R.N. Alyautdin, N.G. Preferansky; ed. R.N. Alyautdin. 3rd ed., rev. and enlarged. Moscow: GEOTAR-Media, 2022. 608 pp. ISBN 978-5-9704-7066-4. (Electronic: Student Library)
6. Fedukovich N.I. Pharmacology: textbook. Rostov-on-Don: Phoenix, 2022. ISBN 978-5-222-35174-1. (Electronic: Student Library)
7. Chabanova V.S. Pharmacology: textbook. 2nd ed. Minsk: Vyshheyskaya Shkola, 2021. 448 pp. ISBN 978-985-06-3319-4. (Electronic: Lan e-library)

8.2. List of Educational and Methodological Support for the Independent Work of Students in the Discipline (Module)

Anenko D.S. Methodological guidance on the course “Pharmacology” for students of the speciality 31.05.01 General Medicine [Electronic version], Stavropol: North-Caucasus Federal University (electronic version).

8.3. List of Resources of the Information and Telecommunications Network **Internet** Required for Mastering the Discipline (Module)

1. <http://rudocor.net/> – Medical portal
2. <http://www.e-reading.club/> – Large online library
3. <http://www.pubmed.com/> – database of biomedical full-text articles
4. <http://www.spravocnikpolekarstvam.ru/> – free online pharmacological reference
5. <https://dic.academic.ru/> – dictionaries and encyclopaedias
6. <https://www.rmj.ru/> – Russian Medical Journal
7. <https://www.studentlibrary.ru/> – Student Library e-resources

9. List of Information Technologies Employed through the Discipline (Module), Including a List of Software and Information Reference Systems

When delivering lectures, computer equipment and demonstrations of multimedia presentation materials are used. In seminars and practical classes, students deliver presentations prepared by them during the hours of independent work.

Information Reference Systems:

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

1.	Official library website of the North-Caucasus Federal University: http://catalog.ncstu.ru
2.	Electronic library system “University Online Library”: www.biblioclub.ru (Agreement No. 50-04/19 dated 13.05.2019)
3.	Electronic library system IPRbooks (License Agreement No. 5168/19 dated 13.05.2019)
4.	eLIBRARY.RU: http://elibrary.ru
5.	GARANT legal information system: http://www.garant.ru/
6.	Free access legal database “Pravo.ru”: http://www.pravo.ru/
7.	ConsultantPlus legal reference system: http://www.consultant.ru

Software:

1.	Alt Workstation 10
2.	Alt Workstation K
3.	Alt Server
4.	Office software package – P7-Office

10. Description of the Material and Technical Resources Required for the Educational Process for the Discipline (Module)

Lecture classes	A classroom equipped with multimedia equipment and technical training facilities.
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Practical classes	A classroom, equipped with multimedia equipment and technical training facilities.
Independent work	A room for the independent work of students, equipped with computer hardware with the capability to connect to the Internet network and provide access to the electronic information and educational environment of the university.

11. Specific Features of Mastering the Discipline (Module) by Persons with Disabilities

Students with disabilities shall be provided with special textbooks, teaching aids, and didactic materials, special technical training facilities for collective and individual use, the services of an assistant (helper) providing the necessary technical assistance to the students, as well as the services of sign language interpreters and tactile sign language interpreters.

The mastery of the discipline (module) by students with disabilities may be organized jointly with other students, as well as in separate groups.

Mastering the discipline (module) by students with disabilities is to be carried out taking into account the peculiarities of psychophysical development, individual capabilities, and health status.

In order to ensure the accessibility of higher education under the educational program for persons with disabilities, the following is provided during the mastery of the discipline (module):

1) for persons with visual impairments:

- the presence of an assistant offering the student the necessary technical assistance, taking into account individual features (help taking the workplace, moving around, reading and formatting the task, including writing under dictation),
- written tasks, as well as instructions on the procedure for their execution, are formatted in an enlarged font,
- special textbooks, teaching aids, and didactic materials (having a large font or audio files),

individual uniform lighting of at least 300 lux,

if necessary, a magnifying device is provided to the student to complete the task;

2) for persons with hearing impairments:

- the presence of an assistant providing the student with the necessary technical assistance, taking into account individual characteristics (helps to take a workplace, move around, read and format the task, including writing with dictation),
- the availability of sound-amplifying equipment for collective use is ensured; if necessary, sound-amplifying equipment for individual use is provided to the student;
- provision with proper sound means of reproducing information is ensured;

3) for persons with musculoskeletal disorders (including severe motor function impairments of the upper limbs or the absence of upper limbs):

- written tasks are performed on a computer with specialized software or are dictated to an assistant;
- at the request of the student, tasks may be performed verbally.

12. Specific Features of Implementing the Discipline with the Use of Distance Learning Technologies and E-Learning

Subject to Part 1 of Article 16 of the Federal Law of December 29, 2012, No. 273-FZ On Education in the Russian Federation, e-learning shall be viewed as the arrangement of educational activities employing information contained in databases and used in the implementation of educational programs, as well as information technologies, technical means, and information and telecommunication networks that ensure the processing and transmission of the specified information via communication lines, and the interaction of students and pedagogical workers.

Remote (distance) learning technologies are understood as educational technologies implemented mainly with the use of information and telecommunication networks during the indirect (at a distance) interaction of students and pedagogical workers.

The implementation of the discipline may be carried out with distance learning technologies and e-learning in full or in part. The components of the Educational And Methodological Complex (EMC) of the discipline (working program of the discipline, assessment and methodological materials, forms of attestation) implemented with the use of distance learning technologies and e-learning contain an indication of their use.

When arranging educational activities with distance learning technologies and e-learning, asynchronous and synchronous methods of interaction between participants in educational relations via the information and telecommunications network Internet may be offered.

When using distance learning technologies and e-learning, the schedule for the discipline shall indicate: methods of interaction among participants in educational relations via the information and telecommunications network Internet (VCC – videoconferencing, ET – electronic testing); links to the electronic information and educational environment of NCFU, to educational platforms and resources of other organizations to which open access is provided via the information and telecommunications network Internet; for synchronous learning – the time of online classes and instructors; for asynchronous learning – the authors of online courses.

When arranging intermediate attestation with distance learning technologies and e-learning, the Methodological Recommendations on the use of technical means ensuring the objective reliability of results when conducting intermediate and state final attestation for higher education educational programs – Bachelor's Degree programs, Specialist's Degree programs, and Master's Degree programs with distance learning technologies are used (Letter of the Ministry of Science and Higher Education of Russia dated December 7, 2020, # MN-19/1573-AN On sending 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 NCFU, to which students are provided access via the information and telecommunications network Internet, or using the resources of other organizations, including platforms providing services for videoconferencing, online meetings, and distance learning (MTS-Link), as well as using the capabilities of social networks to carry out communication between students and instructors.

The educational and methodological support for a discipline shall be ensured with e-learning and distance learning technologies includes the working program presented in electronic form, educational and methodological manuals or a course of lectures, methodological guidelines for performing 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 NCFU.