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Federal State Autonomous Educational Institution
Higher Education
"NORTH CAUCASUS FEDERAL UNIVERSITY"

APPROVED BY
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INTERNSHIP PROGRAM
"Introductory practice"

Field of study	11.03.02 Infocommunication Technologies and Communication Systems
Profile	Intelligent Data Processing in Infocommunication Systems and Networks
Year of start of training	2026
Form of study	Full-time
Implemented in a semester	2

Developed by

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1. Internship Goals

The objectives of the educational introductory practice in the direction of training 11.03.02. Infocommunication technologies and communication systems are: consolidation and deepening of theoretical knowledge gained by students in the study of disciplines of the curriculum, acquisition and development of the necessary practical skills and abilities in accordance with the requirements for the level of training of a graduate, study of the current state and directions of development of information and communication technologies.

2. Objectives of the practice

The objectives of educational introductory practice are:

- familiarization with the methods of team building, team interaction and monitoring of teamwork when working together within the framework of the task using methods, information technologies and foresight technologies;
- familiarization with the general characteristics of ensuring security and sustainable development in the field of infocommunications;
- familiarization with the methods of accumulating, transmitting and processing information;
- familiarization with mathematical methods for solving problems of a theoretical and applied nature;
- familiarization with the methods of searching and analyzing information necessary to solve the problem, choosing the optimal solution and assessing its advantages and disadvantages;
- familiarization with the main methods of conducting experimental research, methods and means of measuring and conducting experimental research;
- familiarization with the methods of processing and presenting the data obtained and assessing the error of measurement results;
- familiarization with the basic laws of information transmission in information and communication systems, the main types of signals used in telecommunication systems, the features of the transmission of various signals through channels and paths of telecommunication systems;
- familiarization with the capabilities of computer technology and software for solving problems of control and algorithmization of information processing processes;
- familiarization with the methods of computer modeling of physical processes in the transmission of information, engineering and computer graphics techniques;
- familiarization with the rules for choosing programming languages and languages for working with databases, environments for the development of information systems and technologies, based on the existing tasks.

3. The Place of Practice in the Structure of the Educational Program of Higher Education

The place of educational practice in the structure of the EP: B2.O.01(U) "Introductory practice" refers to the mandatory part of the block "Block 2. Practice".

Educational introductory practice is logically and meaningfully and methodologically interrelated with other parts of the EP, in particular, it is based on the following disciplines:

1. Philosophy.
2. Advanced Mathematics
3. Linear Algebra
4. Advanced Language Programming C
5. Introduction to Engineering Culture

4. Place and time of the internship

The bases of educational introductory practice are departments, departments, laboratories of the university and other organizations of the city, which have: modern equipment, hardware and software for conducting research in the field of infocommunications, appropriate technologies and the necessary personnel scientific and technical potential.

Internship in third-party organizations is based on contracts, according to which students are provided with internship places, organizational, informational and methodological assistance in the process of internship. Such organizations are: Rostelecom PJSC, Signal PJSC, Telecom-S LLC, VimpelCom PJSC, Megafon PJSC, Energomera Concern PJSC, Monocrystal PAA. Students can independently search for internship places. In this case, students submit to the department a petition (consent) of the organization to provide a place for internship with an indication of the period of its implementation. If there are vacant positions, students can enroll in them if the work performed meets the requirements of the internship program.

The choice of places for practical training for disabled persons and persons with disabilities is carried out taking into account the requirements of their accessibility for this category of students. When determining places of educational practice for disabled persons and persons with disabilities, the recommendations of medical and social expertise reflected in the individual rehabilitation program of a disabled person regarding the recommended conditions and types of work must be taken into account.

Introductory practice is carried out in the 1st year, in the 2nd semester for 6 weeks.

5. List of planned results of the internship, correlated with the planned results of the development of the educational program

Code, formulation of competence	Indicator code, wording	Planned results characterizing the stages of the formation of competencies, indicators
UK-3 Able to carry out social interaction and fulfill his role in the team	ID-1 UK-3 participates in interpersonal and group interaction, using an inclusive approach, effective communication	Performs the assigned tasks of practice as part of a group, observing the rules of social interaction.
	ID-2 UK-3 ensures the work of the team to obtain optimal results of joint work, taking into account the individual capabilities of its members, the use of methodology for achieving success, methods, information technologies and foresight technologies	Applies effective methods of teamwork to obtain optimal work results and their analysis. Applies information technologies and foresight technologies.
	ID-3 UK-3 ensures the fulfillment of tasks based on monitoring teamwork and timely response to significant deviations	Performs the assigned tasks of the practice, as well as ensures their implementation based on the monitoring of teamwork.
UK-4 Is able to carry out business communication in oral and written forms in the state language of the Russian Federation and a foreign language(s)	ID-1 UK-4 chooses an acceptable style of business communication in the state and foreign languages, verbal and non-verbal means of interaction with partners in oral and written forms;	Fulfills the tasks of practice, choosing an acceptable style of business communication in the state and foreign languages, verbal and non-verbal means of interaction with partners in oral and written forms

	ID-2 ^{UK-4} uses information and communication technologies to increase the efficiency of professional interaction, search for the necessary information in the process of solving standard communicative tasks in the state and foreign languages;	Searches for the necessary information in the process of solving standard communicative tasks in the state and foreign languages, and also uses information and communication technologies to improve the efficiency of professional interaction
	ID-3 ^{UK-4} evaluates the effectiveness of the applied communication technologies in professional interaction in the state and foreign languages, and selects the optimal ones.	In the performance of the assigned tasks, the practice evaluates the effectiveness of the applied communication technologies in professional interaction in the state and foreign languages, and makes a choice of optimal
UK-5 Able to perceive the intercultural diversity of society in socio-historical, ethical and philosophical contexts	ID-1 ^{UK-5} identifies, compares and analyzes information about the cultural characteristics and traditions of various social groups, in order to choose a strategy for interaction with their carriers;	Searches for the information necessary to solve the tasks, identifying and analyzing information about the cultural characteristics and traditions of various social groups, to choose a strategy for interacting with their carriers
	ID-2 ^{UK-5} demonstrates a respectful attitude to the historical heritage and socio-cultural traditions of various social groups, based on knowledge of the stages of historical development of Russia (including the main events, the main historical figures) in the context of world history and a number of cultural traditions of the world (depending on the environment and the objectives of education), including world religions, philosophical and ethical teachings;	Fulfilling the tasks of the practice, he demonstrates a respectful attitude to the historical heritage and socio-cultural traditions of various social groups
	ID-3 ^{UK-5} chooses ways of constructive interaction with people, taking into account their socio-cultural characteristics, in order to successfully perform professional tasks and strengthen social integration;	Fulfilling the tasks of the practice, chooses ways of constructive interaction with people, taking into account their socio-cultural characteristics in order to successfully perform professional tasks and strengthen social integration
	ID-4 ^{UK-5} analyzes various socio-cultural trends, facts and phenomena on the basis of a holistic view of the foundations of the universe and the	Analyzes various socio-cultural trends, facts and phenomena on the basis of a holistic view of the

	prospects for its development, understands the relationship between the diversity of worldviews and the course of development of history, science, human ideas about nature, society, cognition and oneself.	foundations of the universe and the prospects for its development
UK-8 Is able to create and maintain safe living conditions in everyday life and in professional activities to preserve the natural environment, ensure the sustainable development of society, including the threat and occurrence of emergencies and military conflicts	ID-1 _{UK-8} is familiar with the general characteristics of ensuring security and sustainable development in various spheres of life; classification of military emergencies, principles and methods of organizing the protection of the population from dangers arising in peacetime and during military operations;	Understands the general characteristics of security and sustainability in the field of infocommunications
	ID-2 _{UK-8} assesses the probability of potential danger in everyday life and professional activities and takes measures to prevent it	Takes measures to prevent possible threats to life
	ID-3 _{UK-8} applies the basic methods of protection in the threat and occurrence of emergencies and military conflicts in everyday life and professional activities.	Complies with workplace safety requirements when performing internship tasks
OPK-1 Able to use the provisions, laws and methods of natural sciences and mathematics to solve engineering problems	ID-1 _{OPK-1} understands the fundamental laws of nature and the basic physical mathematical laws and methods of accumulating, transmitting and processing information.	Is familiar with the methods of accumulating, transmitting and processing information. Understands the fundamental laws of nature and the basic physical mathematical laws.
	ID-2 _{OPK-1} applies physical laws and mathematical methods to solve problems of a theoretical and applied nature.	He applies the fundamental laws of nature and the basic physical mathematical laws in solving practical problems.
	ID-3 _{OPK-1} uses the knowledge of physics and mathematics to solve practical problems.	He has knowledge of physics and mathematics, uses them to solve practical problems.
OPK-2 Is able to independently conduct experimental research and use the basic methods of processing and presenting the data obtained	ID-1 _{OPK-2} finds and critically analyzes the information necessary to solve the problem.	Analyzes the information necessary to solve practical problems.
	ID-2 _{OPK-2} develops a solution to a specific problem, choosing the best option, evaluating its advantages and disadvantages.	Solves specific problems of practice, evaluates the result of the solution.

	ID-3 _{OPK-2} understands the basic methods and means of conducting experimental research, standardization and certification systems.	Understands the basic methods of conducting experimental research, methods and means of measuring and conducting experimental research.
	ID-4 _{OPK-2} selects methods and means of measurement and conducts experimental research.	Selects the main methods of conducting experimental research, methods and means of measuring and conducting experimental research.
	ID-5 _{OPK-2} is proficient in the methods of processing and presenting the data obtained and assessing the error of measurement results.	Applies the main methods of conducting experimental research, methods and means of measuring and conducting experimental research.
OPK-3 Is able to apply methods of search, storage, processing, analysis and presentation of information from various sources and databases in the required format, while observing the basic requirements of information security	ID-1 _{OPK-3} understands the basic patterns of information transmission in infocommunication systems, the main types of signals used in telecommunication systems, the features of the transmission of various signals through channels and paths of telecommunication systems.	Understands the basic patterns of information transfer in information and communication systems
	ID-2 _{OPK-3} understands the principles, basic algorithms and devices of digital signal processing; the principles of building telecommunication systems of various types and methods of information distribution in communication networks.	Understands the principles, basic algorithms and devices of digital signal processing.
	ID-3 _{OPK-3} solves data processing problems using computer technology.	Solves problems of data retrieval and processing using computer technology
	ID-4 _{OPK-3} builds probabilistic models for specific processes, carries out the necessary calculations within the framework of the built model.	Builds models for specific processes, performs the necessary calculations
	ID-5 _{OPK-3} has methods and skills for ensuring information security.	Observes the basic requirements of information security when solving practical problems by means of computer technology
OPK-4 Able to understand the principles of modern	ID-1 _{OPK-4} uses information and communication technologies when	Carries out the use of information and

information technology and use them to solve professional problems	searching for the necessary information.	communication technologies in the search for the necessary information to solve the tasks of the practice.
	ID-2 ОПК-4 designs a solution to a specific project task, choosing the best way to solve it, based on the current legal norms and available resources and restrictions.	Develops a solution to the tasks of the practice.
	ID-3 ОПК-4 understands modern interactive software systems and basic methods of processing experimental data, including the use of standard software, general and special-purpose software packages.	In the process of solving practical problems, it uses the capabilities of modern software systems and the main methods of processing experimental data.
	ID-4 ОПК-4 uses the capabilities of computer technology and software to solve problems of control and algorithmization of information processing processes.	Uses the capabilities of computer technology and software in the process of solving practical problems
	ID-5 ОПК-4 is proficient in methods of computer modeling of physical processes in the transmission of information, engineering and computer graphics techniques.	Applies methods of computer modeling of physical processes in the process of solving problems
ОПК-5 Capable of developing algorithms and computer programs suitable for practical application	ID-1 ОПК-5 selects programming languages and languages for working with databases, environments for the development of information systems and technologies, based on the existing tasks.	Understands and applies information systems and technology development environments based on existing tasks.
	ID-2 ОПК-5 reads the codes of software products written in mastered programming languages and makes the necessary changes.	Understands and applies the basics of programming when solving practical problems.
	ID-3 ОПК-5 develops original algorithms and computer programs suitable for practical application.	Builds algorithms for solving practical problems.

6. Structure and content of the internship

The total labor intensity of the educational introductory practice is 9 credits, 324 hours.

Sections (stages) of practice	Implemented competencies / indicators	Types of educational work in practice, including independent work of students	Labor intensity (hours)	Forms of current control
Preparatory stage	UK-3 ID-1 UK-3 ID-2 UK-3 ID-3 UK-3 UK-4 ID-1 UK-4 ID-2 UK-4 ID-3 UK-4 UK-5 ID-1 UK-5 ID-2 UK-5 ID-3 UK-5 ID-4 UK-5 UK-8 ID-1 UK-8 ID-2UK-8 ID-3 UK-8	1. Orientation conference, introductory lecture. 2. Assignment of tasks for introductory practice. 3. Introductory briefing at the place of practice, safety briefing. 4. Drawing up a calendar plan for the internship. 5. Approval of the calendar plan by the supervisor. 6. Familiarization with the technical equipment of laboratories. 7. Collection, processing and systematization of factual and literary material.	6	Interview
Introductory Stage	UK-8 ID-1 UK-8 ID-2UK-8 ID-3 UK-8 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 OPK-3 ID-1 OPK-3 ID-2 OPK-3 ID-3 OPK-3 ID-4 OPK-3 ID-5 OPK-3 OPK-4 ID-1 OPK-4 ID-2 OPK-4 ID-3 OPK-4 ID-4 OPK-4 ID-5 OPK-4 OPK-5 ID-1 OPK-5 ID-2 OPK-5 ID-3 OPK-5	1. Study of research methods and experimental work in accordance with the assignment 2. Study of methods of analysis and processing of experimental data 3. Study and justification of design decisions, making decisions on the organization of modeling and experiments. 4. Checking the correctness and effectiveness of the decisions made (together with the manager) 5. Performance of the task for practice in accordance with the requirements of the methodological instructions: implementation of all stages of solving the problem, collection and preliminary processing of initial data, calculations. 6. Processing of the results obtained, preparation of materials and their design. 7. Discussion of the results of work with the supervisor of practice.	294	Solving practical problems, interview

Final stage	UK-3 ID-1 UK-3 ID-2 UK-3 ID-3 UK-3 UK-4 ID-1 UK-4 ID-2 UK-4 ID-3 UK-4 UK-5 ID-1 UK-5 ID-2 UK-5 ID-3 UK-5 ID-4 UK-5 UK-8 ID-1 UK-8 ID-2UK-8 ID-3 UK-8 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 OPK-3 ID-1 OPK-3 ID-2 OPK-3 ID-3 OPK-3 ID-4 OPK-3 ID-5 OPK-3 OPK-4 ID-1 OPK-4 ID-2 OPK-4 ID-3 OPK-4 ID-4 OPK-4 ID-5 OPK-4 OPK-5 ID-1 OPK-5 ID-2 OPK-5 ID-3 OPK-5	Preparation of reporting documents on practice. Preparation of a report and presentation of a speech.	24	Report protection, Performance, test on practice
Total			324	Credit with a grade

7. Methodical recommendations for students on the passage of practice

7.1. Use of the material of the educational and methodological complex of practice

At the first stage, it is necessary to familiarize yourself with the structure of the internship, mandatory types of work and reporting forms, which are reflected in the guidelines for the organization and conduct of the internship, developed at the Department of Infocommunications of NCFU.

For the successful completion of tasks on educational introductory practice, the student needs to independently study the presented sources of literature in detail

No p/n	Type of independent work	Recommended sources of information (No source)			
		Main	Additional	Methodical	Internet Resources
1	Collection, processing and systematization of factual and literary material	1, 2	1-4	1, 2	1-4
2	Implementation of all stages of solving the problem, collection and preliminary processing of initial data, calculations.	1, 2	1-4	1, 2	1-4
3	Preparation of the report	1, 2	1-4	1, 2	1-4

7.2. Fund of Assessment Tools for Practice

The Fund of Assessment Tools (WF) for introductory practice is based on the list of mastered competencies UK-3, UK-4, UK-5, UK-8, OPK-1, OPK-2, OPK-3, OPK-4, OPK-5 with an indication of the stages of their formation in the process of internship. FAT provides objective control over the achievement of planned learning outcomes.

FAT includes

- description of indicators and criteria for assessing competencies at various stages of their formation, description of assessment scales;
- methodological materials that determine the procedures for assessing knowledge, skills, and (or) experience of activity, characterizing the stages of competence formation;
- standard control tasks and other materials necessary to assess knowledge, skills and the level of mastery of the formed competencies in the process of internship.

The FAT is an appendix to this internship program.

8. Educational, methodological and information support of practice

8.1. Recommended literature.

8.1.1. Reference citations:

1. Sokolov S.V. Electronics [Elektronnyi resurs]: uchebnoe posobie dlya vuzov / Sokolov S.V., Titov E.V. – Electron. tekstovye dannye. – M.: Goryachaya liniya - Telekom, 2013. – 204 p. – Rezhim dostupa: <http://www.iprbookshop.ru/37144>. – EBS «IPRbooks»

2. Shpakov P. S., Yunakov Y. L. Mathematical processing of measurement results: a textbook / Publisher: Siberian Federal University, 2014. - URL: http://biblioclub.ru/index.php?page=book_red&id=435837&sr=1

8.1.2. Further reading

1. Yakovlev S. V. Elektronika : uchebnoe posobie [Electronics: a textbook] / S. V. Yakovlev – Stavropol : SevKavGTU, 2014. – 270 p.

2. Karlashchuk V. I. Electronic Laboratory on IBM PC: Laboratory Workshop on Electronics Workbench and Vissim on Elements of Telecommunication Systems. - Electronic Laboratory on IBM PC, 2022-05-25. - Electron. dan. (1 file). - Moscow : SOLON-Press, 2016. - 480 p. - Electronic. - The book is in the premium version of EBS IPR BOOKS. - ISBN 5-98003-211-8

3. Menshenin, S. E. Theoretical foundations of electrical engineering. Application of the program "Electronics Workbench" in the calculation of linear electric circuits of direct current: a textbook / S. E. Menshenin. - Theoretical foundations of electrical engineering. The use of the program "Electronics Workbench" in the calculation of linear electric circuits of direct current, The entire term of copyright protection. - Electron. dan. (1 file). - Saratov: IPR Media, 2020. - 60 p. - electronic. - The book is in the premium version of EBS IPR BOOKS. - ISBN 978-5-4497-0415-3

4. Sergeeva, A.S. Basic skills of working with software in a technical university. MS Office

Package (Word, Excel, PowerPoint, Visio), Electronic Workbench, MATLAB Electronic resource: textbook / A.S. Sinyavskaya / A.S. Sergeeva. - Novosibirsk : Siberian State University of Telecommunications and Informatics, 2016. - 263 p. - The book is in the basic version of the EBS IPRbooks.

8.1.3. Methodical literature

1. Regulations on Practical Training of Students of the Federal State Autonomous Educational Institution of Higher Education "North Caucasus Federal University". APPROVED BY the decision of the Academic Council of NCFU Protocol No 6 of December 24, 2020.

2. Guidelines for educational introductory practice in 2 parts. - Stavropol: NCFU, 2026. (e. VAR).

8.1.4. Internet Resources

- 1 Official site of the Scientific Library of the Federal State Autonomous Educational Institution of Higher Education of NCFU [Electronic resource] // <http://catalog.ncfu.ru/catalog/ncfu>.
- 2 Official site Consultant Plus [electronic resource] // <http://www.consultant.ru>.
- 3 Information and legal portal "Garant" [electronic resource] // <http://www.garant.ru/>
- 4 Scientific Electronic Library eLIBRARY.RU [Electronic resource] // <http://elibrary.ru>.

8.2. Software

1. Computer program Alt Workstation 10.
2. Computer program Alt Workstation K.
3. Computer program Alt "Server".
4. Office software package - P7-Office.

8.3. Material and technical support of the internship

A classroom equipped with equipment and technical means of training for the presentation of educational information.

- Laboratory "Telecommunication Lines; included;
 - Spartan 3E FPGA set – 3 pcs.;
 - 5 x Yarboly 8586 soldering stations, 1 x ACHI infrared soldering station IR12000;
 - machine with numerical control CNC3018 – 1 pc.;
 - Voltera V-one 3D printer – 1 pc.;
 - direct current sources B5-50 – 1 pc., B5-43A – 1 pc., power supply unit Korad Ka 30050 – 2 pcs.;
 - universal voltmeter V7-21A – 1 pc., universal digital voltmeter CW INSTEK GDM-8246 – 1 pc.;
 - functional generators ANR-3122 Aktakak – 1 pc., optical and electric pulses combined OG5-87 – 1 pc., pulses G5-82 – 1 pc., pulses of special shape AKIP-3407/4A – 1 pc.;
 - 1 x GW INSTEK GOS-6526 oscilloscope, 1 x universal oscilloscope S1-99;
 - stand with fiber-optic cables – 1 pc.;
 - 5 workstations consisting of: system. block P4-3,2 / HDD 160 / 2048 / keyboard / mouse / carpet or system. Unit C 3,33 / 80 / 256 * 2 / CD-RW / keyboard / mouse, monitor 17 TFT" Philips.
- Connection to the Internet, access to the corporate network of the university.

10. Features of the development of practice 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 (assistant) who provides students with the necessary technical assistance, as well as the services of sign language interpreters and typhlo-sign interpreters.

The development of introductory practice by students with disabilities can be organized together with other students, as well as in separate groups.

The development of introductory practice by students with disabilities is carried out taking into account the characteristics of psychophysical development, individual capabilities and health status.

In order to ensure the availability of higher education under the educational program for persons with disabilities when mastering the introductory practice, the following is ensured:

1) for visually impaired persons:

- the presence of an assistant who provides the student with the necessary technical assistance, taking into account individual characteristics (helps to take a workplace, move, read and complete the task, including by writing down by dictation),

- written tasks, as well as instructions on the procedure for their implementation, are drawn up in enlarged font,

- special textbooks, teaching aids and didactic materials (with large print or audio files),

- individual uniform lighting of at least 300 lux,

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

2) for persons with hearing disabilities:

- the presence of an assistant who provides the student with the necessary technical assistance, taking into account individual characteristics (helps to take a workplace, move, read and complete the task, including by writing down by dictation),

- the availability of sound-amplifying equipment for collective use is ensured, if necessary, the student is provided with sound-amplifying equipment for individual use;

- is provided with appropriate sound means of reproducing information;

3) for persons with disabilities with musculoskeletal disorders (including those with severe disorders of the motor functions of the upper extremities or the absence of upper limbs):

- written tasks are performed on a computer with specialized software or dictated to an assistant;

- At the request of the student, tasks can be performed orally.