

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

SUGGESTIONS FOR TEACHING
on the organization and conduct of industrial operational practice /
Operational practice

for students of the field of study
11.03.02 Infocommunication Technologies and Communication Systems
"Intelligent Data Processing in Infocommunication Systems and Networks"

Stavropol 2026

The guidelines are compiled in accordance with the Federal State Educational Standard of Higher Education for the training of bachelors in the direction 11.03.02 "Infocommunication Technologies and Communication Systems" and taking into account modern requirements for the training of specialists of a technical university, the standards of the Federal State Educational Standard. These instructions provide recommendations for the organization of industrial pre-diploma practice

For this practice, sample tasks and requirements for the design and content of the diary and the internship report are given.

Recommended for bachelor's degree programs 11.03.02
"Infocommunication Technologies and Communication Systems"

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1 Introduction

Operational practice is carried out in accordance with the programs for full-time and part-time students in the field of training 11.03.02

"Infocommunication Technologies and Communication Systems", training profile – Intelligent Data Processing in Infocommunication Systems and Networks.

Internship programs contain requirements for the organization and procedure for conducting practical training of students, its main content.

The program formulates the rights and obligations of interns, considers the list of issues for students to study, as well as the requirements for the formation and defense of the internship report.

Methodical instructions are intended for students of the specified specialty, teaching staff of graduating departments, heads of practice from the department and the enterprise.

Internship schedule

	Semester	Number of weeks
Operational Practices	6	2

2 Purpose of operational practice

The purpose of operational practice is to increase the level of professional training of certified specialists within the framework of the educational process, as well as to study the issues of production organization on the example of a specific enterprise, the development of skills in working with modern telecommunication equipment and technical documentation.

The main tasks of operational practice:

- familiarization with the organizational and production structure of the enterprise of the communications industry and job descriptions of service personnel;
- study of organizational and technical measures to ensure life safety at the enterprise;
- study of modern technologies, telecommunications, auxiliary and control and measuring equipment;
- familiarization with the system of technical operation of telecommunication equipment, methods of monitoring channels and transmission paths, methods of finding and eliminating damage in equipment;
- study of technical solutions to ensure the uninterrupted operation of telecommunications equipment;
- study of regulatory and technical documentation for the design and operation of telecommunications equipment.

3 Location of the internship

As a place for internship, it is recommended:

- telecom operators;
- research and development organizations;
- design organizations;
- construction and installation enterprises;
- industrial enterprises equipped with modern telecommunication equipment, measuring and computer equipment.

In order to organize the operational practice of one or a group of students at a particular enterprise, an agreement is concluded between the administration of the educational institution and the administration of the enterprise.

Sending students to practice is formalized by an order (directive) of the institute.

Admission of students to practice and their distribution to departments and workplaces is formalized by an order of the enterprise.

4 Practice Guidance

The management of operational practice is carried out by the dean's office and the graduating department. The person responsible for the management of operational practice from the graduating department is appointed from among the experienced teachers of the department by the order of the institute.

At the enterprise, a manager from the engineering and technical personnel is assigned to the intern, who is appointed by the order of the organization.

The Institute provides:

- distribution of students for internship;
- conclusion of contracts with enterprises;
- preparation of an order to send students to practical training;
- issuance of referrals and diaries for practice at the end of the examination session.

Internship supervisor from the graduating department:

- carries out methodical management of the operational practice of students;
- ensures the implementation of preparatory and current work on the organization of practice;
- develops a program of operational practice, individual tasks for students with the indication of basic and additional literature;
- if necessary, coordinates the program and individual tasks of practical training with managers from enterprises;
- prepares and conducts organizational meetings together with the dean's office

students before the start of the internship;

- if necessary, consults students during the period of operational practice and before the defense of reports;

- together with the Institute, within two weeks after the end of the internship, organizes and accepts the defense of reports on the internship;

- submits the results of operational practice to the department;

- participates in the preparation and conduct of the scientific and methodological conference of students on the results of the internship, summarizes the practice of students of the department;

- organizes the storage of reports and diaries of students on practice at the department for a set period.

The head of the internship from the enterprise provides:

- management of the student's activities during the internship in accordance with the program, individual assignment and technical capabilities;

- gives daily individual tasks to the student and ensures control of the completeness and quality of its implementation;

- if necessary, coordinates the individual task for the student with the head of the department;

- At the end of the internship, he gives the student a reference on the level of his technical training, acquired skills, his discipline, diligence and initiative in work, on the student's participation in the social life of the organization.

5 Procedure for conducting internship at the enterprise

Students are obliged to arrive at the enterprise (organization) within the time specified in the internship agreement. The student's stay in the internship is formalized by the order of the enterprise.

On the first day, students are briefed on occupational health and safety and get acquainted with the organizational structure of the enterprise as a whole. In accordance with the internship program and individual assignment, students are assigned to workplaces. To manage the internship, focused on the specifics of the enterprise and its divisions, each intern is assigned a supervisor from the

Numbers
qualified
and

experienced specialists.

During the internship, students observe and fulfill all the requirements in force at the enterprise, the rules of internal labor regulations. For the duration of the internship, the student can be hired for a vacant full-time position with the performance of a specific production task and remuneration. In this case, all the provisions of labor legislation and the provisions of the relevant job description apply to him.

Practice management and control over the implementation of individual tasks is carried out by the assigned supervisor.

Head of the internship from the enterprise:

- provides conditions for the performance of individual tasks, obtaining information by students about the technique and technology of production, the organization of production and labor, economics and production management and the implementation of the internship program as a whole;
 - in accordance with the technical and organizational capabilities, develops an individual plan of the student's work for each day during the entire period of practice;
 - daily monitors the student's performance of individual tasks, internal regulations of the enterprise, keeping an internship diary;
 - if necessary, coordinates the program and individual task of the student with the head of the internship from the department;
 - advises the student on organizational and technical issues, keeping a diary, the content of the report;
 - assists 4th year students in choosing and clarifying the topics of diploma works of practical interest to the enterprise;
 - assists in the selection, systematization and analysis of material for the development of a diploma project;
- at the end of the internship
- checks and certifies the practice diary;
 - verifies the content of the internship report;
 - gives an opinion on the student's work during the internship, with an assessment of his fundamental, general professional and special training, attitude to the performance of tasks and the internship program.

On the last day of the internship, students finalize the diary and the internship report, agree on their content with the supervisor. A student who has not completed the internship program and received a negative feedback on the work is sent to the internship again or expelled from the university.

6 Rights and obligations of students during the internship period

During the internship, students have the right to:

- receive the necessary information to complete an individual assignment or thesis;
- use the library of the enterprise, and with the permission of the chief specialists and heads of departments, information funds and technical archives of the enterprise;
- receive competent advice from the company's specialists on the issues provided for by the internship assignment or diploma work;
- with the permission of the head of the internship from the enterprise and the head of the department, use computing and office equipment to process information related to the performance of an individual task;

During the internship, students are obliged to:

- fully and independently perform the tasks provided for by the program and the schedule of the internship;
- collect, systematize, process and analyze the collected information and illustrative materials in accordance with the individual task;
- be responsible for the performance of the assigned work at the workplace and ensure the necessary quality of its performance;
- regularly keep an internship diary and timely submit it for control to the internship manager at the enterprise;
- obey the internal labor regulations in force at the enterprise, strictly observe the rules of labor protection;
- At the end of the internship, submit a diary and a report on the internship from the enterprise to the head of the internship in order to check and protect them.

A student who has not completed the internship program and the task within the established period, who has received a negative review from the supervisor or an unsatisfactory grade during the defense, sanctions are applied as a low-achieving student, up to expulsion from the university.

If a student violates labor discipline and internal regulations of the enterprise, on the recommendation of the head of the department and the head of the internship from the enterprise, he can be suspended from the internship, which is reported to the dean of the faculty and the head of the graduating department. At their suggestion, the director may consider the issue of expelling the student from the university.

7 Composition of the internship task

The content of operational practice is determined by its purpose, the stage of training of the student, the specifics of the enterprise and the workplace of the intern.

A number of issues studied are common to all levels of operational practice, but the depth of study of issues, awareness of certain technical and organizational solutions should increase with each practice.

The general objectives of the practice are:

- study of the structure of the enterprise, organization and technology of production, the main functions of production, economic and managerial units;
- study of material and technical and personnel support of production;
- study of modern technologies and equipment used in the telecommunication industry, comparison of technologies and equipment from different manufacturers;
- study of organizational and technical measures to ensure life safety at the enterprise as a whole, as well as at the

equipment maintenance and construction and installation works;

- study of issues of production organization;
- Study of ITU-T recommendations, the main regulatory documentation used in the enterprise as a whole and in the workplace.

If necessary, the thematic plan can be adjusted taking into account the specifics of the place of internship or the topic of the diploma project. Adjustment of the plan is carried out with the participation of the head of the internship from the graduating department and certified by him.

8 Contents of the Internship Report

The internship diary is the main reporting document confirming and characterizing the student's internship.

The diary reflects the basic information about the place, terms, content and results of the internship.

Data on the place of internship, the start and end dates of the internship must be certified by the personnel department of the enterprise. The absence of the signature of the HR inspector and (or) seals makes this document invalid.

The student receives an individual assignment for the internship in accordance with the purpose of the internship, the place and features of its passage. If necessary, the task is corrected by the head of the internship from the department with the participation of the head of the internship from the enterprise and the student.

The calendar plan for the implementation of the internship program is maintained by the student **on a daily basis**. The work plan is drawn up jointly with the head of the enterprise. It must correspond to the individual task for the internship, the approximate distribution of the time standard (given in the task).

The diary contains a brief summary of the work performed. Upon completion of the work, the supervisor certifies the fact of their completion.

At the end of the internship, the head of the enterprise gives a conclusion on the completeness of the internship program and a characteristic to the student. The characteristic should contain: the level of professional training (taking into account the level of training), the student's responsibility, his interest in acquiring professional knowledge and skills, the degree of independence in performing the task, and other personal qualities shown in the process of practice. The supervisor must evaluate the student's work during the internship on a five-point system.

The review of the head of the internship from the enterprise **is certified by a seal**.

The review of the head of the internship from the graduating department is drawn up during the certification of the student based on the results of the internship.

In addition to the diary, the student draws up a report on operational practice.

Structure of the report:

- title page;
- content;
- material collected in practice;
- Bibliography.

The internship report is compiled individually by each student and should reflect the material studied, his practical activities during the internship, and the skills mastered.

Approximate content of the report.

- Introduction (the purpose of operational practice, features of its passage, participation in the implementation of real projects).

- Characteristics of the enterprise (history of the creation and development of the enterprise, the place of this enterprise in the unified telecommunication network, organizational structure of the enterprise, the purpose of the main departments, interaction of workshops and services, an approximate scheme of the organization of communications).

- Characteristics of the main telecommunication equipment used at this enterprise (brief description of the transmission system, purpose, composition of equipment, technical characteristics, functional diagram of the terminal station equipment, purpose of the main units).

- Characteristics of auxiliary equipment.

- Plan of equipment placement in the LAC.

- Organization of technical operation in the subdivision (list and purpose of the equipment operation performed, what network monitoring system is used in this section, list of monitored parameters of channels and paths, brief characteristics of control and measurement equipment, methods of checking and adjusting the equipment of channels and transmission paths, etc.).

- List, feature and description of practical work performed by the student during the internship.

- Measures to ensure safety in the unit.

- The company's development strategy, main economic indicators, regulatory data for performing calculations in the diploma project.

- Materials necessary for writing a diploma project.

- Conclusion (results of operational practice, conclusions and proposals of the student on practice).

- List of references, technical and regulatory documentation.

The head of the enterprise must check the content of the internship report in order to check the literacy of its implementation, the admissibility of disclosure of certain information.

9 Attestation based on the results of the internship

For attestation based on the results of the internship, the student is obliged to submit to the graduating department within three days from the beginning of the semester following the internship:

- practice diary, filled out in all sections, certified by seals;
- feedback from the head of the internship from the enterprise on the student's work during the internship period with an assessment of the level of his training in the specialty, attitude to the implementation of the internship program, discipline, etc. (drawn up at the end of the diary, certified by a seal);
- Internship Report.

Attestation is carried out by the head of practice from the graduating department within two weeks from the beginning of the semester in accordance with the schedule.

Certification is carried out based on the results of the interview, on the basis of the diary, the internship report, as well as the feedback of the internship supervisor from the enterprise. Based on the results of the certification, a grade is given according to a five-point system.

A student who has not submitted documents on operational practice within the established time limits and has not passed certification is considered to be underachieving for the semester preceding the internship. Administrative measures are applied to him/her in accordance with the established procedure.

10 Educational, methodological, informational and logistical support of the practice

10.1 List of basic literature:

1. Katunin G. P., Mamchev G. V., Popantonopulo V. N. [Telecommunication systems and networks]. In 3 volumes. [Electronic resource]: textbook / G. P. Katunin, G. V. Mamchev, V. N. Popantonopulo [i dr.]. – Electron. dan. – M. : Goryachaya liniya-Telekom, 2014. – 672 p. – Mode of access: http://e.lanbook.com/books/element.php?pl1_id=63223.
2. Krukhmalev V. V., Gordienko V. N., Mochenov A. D. ; edited by A. D. Mochenov. - 2nd ed., revised and supplemented - Moscow: Hot Line - Telecom, 2014. - 372 p.
3. Akulinichev, Y.P. Theory and Technique of Information Transmission: Textbook / Yu.P. Akulinichev, A.S. Berngardt. - Tomsk: Tomsk State University of Control Systems and Radioelectronics, 2014. - 209 p. : ill., tabl., schemes. - ISBN 978-5- 4332-0035-7; The same [Electronic resource]. - URL: <http://biblioclub.ru/index.php?page=book&id=208952>

10.2 List of additional literature

1. Kuritsyn S. A. Telecommunication Technologies and Systems. S. A. Kuritsyn. Moscow, Akademiya Publ., 2008. 298 p.: ill. (Higher Professional Education. Radio Engineering) (Textbook). References: p. 295. – ISBN 978-5-7695-2999-3.
2. Shpakov P. S., Yunakov Y. L. Mathematical processing of results Measurements: Tutorial / Publisher: Siberian Federal University, 2014
[Electronic resource]. - URL:
http://biblioclub.ru/index.php?page=book_red&id=435837&sr=1
3. Gordienko V. N., Krukhmalev V. V., Mochenov A. D. [and others]. – Electron. dan. – Moscow: Hot Line-Telecom, 2011. – 368 p. – Mode of access: http://e.lanbook.com/books/element.php?pl1_id=5147
4. Bitner V.I. Networks of the new generation – NGN. – Moscow: Hot Line – Telecom, 2011. – 226 p.
5. Nefedov E.I. Antenna-feeder devices and radio wave propagation. Moscow, Akademiya Publ., 2010. 320 p. (in Russian).

10.3 List of educational and methodological support for students' independent work in practice:

Regulations on the Organization and Conduct of Student Internships in the Federal State Autonomous Educational Institution of Higher Education "NORTH CAUCASIAN FEDERAL UNIVERSITY". - Stavropol: NCFU, 2016.

"Operational Practice" : Methodical Directions on the passage of practice / compiled by Samus M.V. - Stavropol : NCFU, 2019.
- 13 p. : ill. (electronic var).

10.4 List of information and telecommunication network resources

"Internet"

<http://www.intuit.ru> – National Open University "INTUIT";
<http://www.edu.ru>.

10.5 List of information technologies used in the internship, including a list of software and information reference systems

Information technology:

- traditional (reproductive) technology;
- technology of creative workshops.

Information reference systems:

Electronic catalog of NCFU <http://catalog.ncfu.ru/catalog/ncfu>

electronic library "University Library ONLINE" <http://biblioclub.ru>

electronic library "IPRbooks" <http://www.iprbookshop.ru>

List of software and information reference systems

1. Operating system: Microsoft Windows 8: 2013-02(3000).
Perpetual license. Contract No 01-ea/13 dated 25.02.2013. End of free support – 2023-01

2. Basic package of Microsoft Office programs (Word, Excel, PowerPoint).
Microsoft Office Standard 2013: Contract No 01-ea/13 dated 25.02.2013, Microsoft Office Licensing <https://support.microsoft.com/ru-en/lifecycle/search/16674>
Lifecycle Start Date 09.01.2013; Office 2013 Service Pack 1 Lifecycle Start Date 25.02.2014, Main Support End Date 10.04.2018; Additional Support End Date 11.04.2023

10.6 Description Material and technical bases, necessary for practice

Equipment of enterprises and organizations.