

MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION
Federal State Autonomous Educational Institution for Higher Education
«North-Caucasus Federal University»

APPROVED BY

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INDUSTRIAL PRACTICE PROGRAM

Industrial Practice
Practice in obtaining professional skills and professional
experience

Field of study	13.04.02 Electric Power Engineering and Electrical Engineering
Specialization (Profile)	Training Program of Electrical Engineering
Year of commencement of studies	2026
Mode of study	full-time
Implemented in semester(s)	4

Developed by:

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1. Objectives of the Practice

The objectives of the work practice – practice for obtaining professional skills and experience of professional activity in the field of study 13.04.02 Electric Power Engineering and Electrical Engineering – are to prepare for a conscious and in-depth study of general professional and specialized disciplines, to acquire practical skills in organizing professional activities, handling technological means for the development and maintenance of documentation, product quality control, and to become familiar with the specific features of particular industrial enterprises or research and design organizations.

2. Tasks of the Practice

The objectives of the practice are:

- acquiring experience in researching a current scientific problem, as well as selecting the necessary materials for the completion of the final qualifying work;
- systematizing the theoretical knowledge acquired during the learning process, as well as expanding and deepening it within the framework of a limited scientific problem;
- improving practical skills and abilities in solving a scientific problem in the field of electric power engineering and electrical engineering;
- developing skills in independent research and experimental methodological work, as well as using a variety of scientific tools in the form of research methods, techniques, and approaches;
- determining the theoretical and practical preparedness of the graduate to perform professional tasks corresponding to their qualifications.

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

The practice belongs to Block 2. Practice, Mandatory Part. The completion of the practice is based on the discipline "Research Methodology."

4. Place and Time of the Practice

The bases for the work practice of students in the field of study 13.04.02 "Electric Power Engineering and Electrical Engineering" are the structural units of the university equipped with modern equipment and testing instruments, as well as enterprises of the North Caucasus Federal District. These include enterprises directly involved in the generation of electric power (power plants) and its distribution (electrical networks and substations of PAO "Rosseti", urban electrical grid networks and substations), as well as enterprises that consume electric power (factories, industrial complexes, housing and utility facilities, electrical installation organizations). Students who have concluded contracts with future employers complete their work practice at the respective enterprises, institutions, and organizations. The practice may take place in various departments of these enterprises (e.g., the dispatch service, substation service, relay protection service, the enterprise's electrical workshop, or the repair shop). This allows for a comprehensive study of the necessary issues corresponding to the practice objectives. Depending on the location of the practice, the content issues are adjusted accordingly. The duration of the practice is established in accordance with the academic plan and the academic calendar for the corresponding academic year. The total duration of the practice is 4 weeks and is conducted in the 4th semester.

5. List of planned results of the practice, mapped to the planned results of mastering the educational program

Competency Code and Formulation	Indicator Code and Formulation	Planned Results Characterizing the Stages of Competency and Indicator Formation
UC-6 Capable of identifying and realising the priorities of one's own activities and ways of improving them based on self-assessment	ID-1UC-6 Assesses one's own resources and their limits (personal, situational, temporal), and uses them optimally to successfully complete an assigned task;	Adequately assesses one's knowledge and professional skills to develop the most effective plan for completing the

		Industrial practice
	ID-2UC-6 Identifies the priorities of personal growth and ways to improve one's own activities based on self-assessment.	Assesses the prospects of one's career growth, determines the choice of a narrow specialization for one's future professional activity.
PC-3 Capable of managing the power system operating mode of an electrical power supply system using digital technologies	ID-1PC-3 Performs calculations of the performance indicators of electrotechnical equipment and its systems;	Calculates the operating mode of electrical equipment
	ID-2PC-3 Ensures the required operating modes and specified parameters of the technological process for elements of power supply systems;	Analyzes the results of calculating the operating modes of electrical equipment
	ID-3PC-3 Applies knowledge of digital technologies in the processes of generation, transmission, and distribution of electrical energy;	Applies modern software packages used at enterprises involved in the production, transmission, and distribution of electrical energy
	ID-4 PC-3 Applies knowledge of digital technologies in the processes of generation, transmission, and distribution of electrical energy;	Reads and understands wiring diagrams and electrical schematic diagrams of electrical equipment Knows safety rules

6. Structure and content of the practice

The total workload of the work practice – practice for obtaining professional skills and experience of professional activity – is 6 credit units, 216 hours

Sections (stages) of practice	Competencies /indicators implemented	Types of academic work during the practice, including independent work	Labor intensity (hours)	Labor intensity (hours)
Introductory lecture	ID-1UC-6 ID-2UC-6	Familiarization with the practice program, consultations on issues arising during the educational practice	2.0	Interview
Safety briefing	ID-1UC-6 ID-2UC-6	Familiarization with safety instructions	2.0	Interview
Collection of materials	ID-1UC-6 ID-2UC-6 ID-1PC-3 ID-2PC-3 ID-3PC-3 ID-3PC-4	Work on the individual assignment	32.0	Interview
Observations	ID-1UC-6 ID-2UC-6	Work on the individual assignment	100.0	Interview

Processing of factual material	ID-1UC-6 ID-2UC-6 ID-1PC-3 ID-2PC-3 ID-3PC-3 ID-3PC-4	Work on the individual assignment	30.0	Interview
Systematization of factual and literary material	ID-1UC-6 ID-2UC-6	Independent work	34.0	Interview
Preparation of the practice report	ID-1UC-6 ID-2UC-6	Formatting of the report	16.0	Defense of the practice

The practice is implemented in the form of practical training. Practical training is a form of organizing educational activities during the completion of an educational program, under which students perform specific types of work related to their future professional activities and aimed at forming, reinforcing, and developing practical skills and competencies relevant to the profile of the corresponding educational program.

7. Methodological Recommendations for Students on Completing the Practice

7.1. Use of the Material from the Educational and Methodological Complex of the Practice

At the first stage, it is necessary to familiarize yourself with the structure of the practice, the mandatory types of work, and the forms of reporting.

For the successful completion of assignments for the work practice – practice for obtaining professional skills and experience of professional activity in the field of study 13.04.02 Electric Power Engineering and Electrical Engineering – the student must prepare and defend a report in accordance with the received individual assignment.

7.2 Assessment tools for the practice

The assessment tools for the educational practice "Introductory Practice" are based on the list of competencies to be mastered, indicating the stages of their formation during the practice. The assessment tools ensure objective monitoring of the achievement of the planned learning outcomes. The assessment tools include:

- a description of indicators and criteria for assessing competencies at various stages of their formation, and a description of grading scales;
- methodological materials defining the procedures for assessing knowledge, skills, abilities, and/or experience of activities that characterize the stages of competency formation;
- standard control tasks and other materials necessary for assessing knowledge, skills, and the level of mastery of the competencies being formed during the practice.

8. Educational, methodological and informational support of the practice

8.1 Recommended literature

8.1.1. Basic literature

1. Rybalova, E.A. Project Management: A Textbook : [16+] / E.A. Rybalova ; Tomsk State University of Control Systems and Radioelectronics (TUSUR), Faculty of Distance Learning. – Tomsk : Faculty of Distance Learning of TUSUR, 2015. – 206 p. : diagrs., tables, ill. – Access mode: by subscription. – URL: <https://biblioclub.ru/index.php?page=book&id=480900> – Bibliography: pp. 175-177. – Text : electronic.

2. Sidorenkov, A.V. Managing the Effectiveness of Groups and Teams in Organizations: A Textbook / A.V. Sidorenkov, N.Yu. Ulyanova ; Ministry of Education and Science of the Russian Federation, Southern Federal University. – Rostov-on-Don : Publishing House of the Southern Federal University, 2016. – 325 p. : diagrs., tables. – Bibliography in the book. – ISBN 978-5-9275-1989-7 ;

Same [Electronic resource]. – URL: <http://biblioclub.ru/index.php?page=book&id=493314>

8.1.2. Additional literature

1. Pavlov, A.N. *Effective Project Management Based on the PMI PMBOK® 6th Edition Standard: A Practical Guide* : [16+] / A.N. Pavlov. – Electronic edition. – Moscow : Laboratory of Knowledge, 2019. – 273 p. : diags., tables. – (Projects, Programs, Portfolios). – Access mode: by subscription. – URL: <https://biblioclub.ru/index.php?page=book&id=494023> (accessed: April 12, 2022). – ISBN 978-5-00101-619-9. – Text : electronic.

2. Krasnostanova, M.V. *From an Inventive Team to a Hi-Tech Corporation: Human Factors and Dynamics of an Innovation Project: A Textbook* / M.V. Krasnostanova. – Moscow : RG-Press, 2014. – 88 p. : diags. – Bibliography in the book. – ISBN 978-5-9988-0270-6 ; Same [Electronic resource]. – URL: <http://biblioclub.ru/index.php?page=book&id=276547>.

8.1.3. Methodological literature

1. Methodological Guidelines for Completing Work Practice – Practice for Obtaining Professional Skills and Experience of Professional Activity in the Field of Study 13.04.02 "Electric Power Engineering and Electrical Engineering"

8.1.4. Internet resources

1. <http://catalog.ncfu.ru> – electronic catalogs of the Association of Electronic Libraries of Educational Institutions and Organizations of the North Caucasus Federal District.

2. <http://elibrary.ru> – Scientific Electronic Library [eLIBRARY.RU](http://elibrary.ru)

3. <https://biblioclub.ru/> Electronic Library System "University Library Online"

4. www.iprbookshop.ru – Electronic Library System IPRbooks

8.2. Software:

No special software is required.

9. Material and technical support of the practice

A classroom equipped with specialized furniture and technical teaching aids used for presenting educational information to a large audience: personal computers, an instructor's computer, a projector, and a magnetic marker board.

10. Features of Completing the Practice for Persons with Disabilities

Students with disabilities are provided with special textbooks, teaching aids and didactic materials, special technical means of learning for collective and individual use, services of an assistant who provides students with the necessary technical assistance, as well as sign language interpreting and typhlo-sign language interpreting services. Completing the practice by students with disabilities may be organized together with other students, as well as in separate groups.

Completion of the 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 accessibility of higher education under the educational program for persons with disabilities during the practice, the following is provided:

1) For persons with visual disabilities:

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

- written assignments, as well as instructions on the procedure for their completion, are formatted 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, a magnifying device is provided to the student for completing the task.

2) For persons with hearing disabilities:

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

- provision of collective sound amplification equipment; if necessary, the student is

- provided with individual sound amplification equipment;
- provision of appropriate sound means of information reproduction.
- 3) For persons with musculoskeletal disorders (including those with severe motor impairments of the upper limbs or absence of upper limbs):
- written assignments are performed on a computer with specialized software or dictated to an assistant;
 - at the student's request, assignments may be completed orally.