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MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION
Federal State Autonomous Educational Institution
Higher Education
"NORTH CAUCASUS FEDERAL UNIVERSITY"

APPROVED BY
Acting Director of the Institute
Advanced Engineering
Cand. Tech. Sci., Associate Professor
A.A. Porokhnya

FUND OF ASSESSMENT TOOLS
"Technological (design and technological) 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	4

Introduction

1. Purpose

The fund of assessment tools in the discipline "Technological (design and technological) practice" is intended for an objective assessment of the level of competence formation.

2. FOS is an appendix to the program of the discipline "Technological (design and technological) practice".

3. The developer is V.P. Mochalov, Associate Professor of the Department of Digital, Robotic Systems and Electronics of the Institute of Advanced Engineering.

4. An examination of the FOC was carried out.

Members of the expert group:

Chairman: V.P. Mochalov, Professor of the Department of Digital, Robotic Systems and Electronics of the Institute of Advanced Engineering.

Members of the Commission:

S.V. Yakovlev, Associate Professor of the Department of Digital, Robotic Systems and Electronics of the Institute of Advanced Engineering.

S.V. Melnikov, Senior Researcher of the Interdisciplinary Training and Research Center for Agricultural Technologies, Associate Professor of the Department of Digital, Robotic Systems and Electronics of the Institute of Advanced Engineering.

Representative of the employer's organization:

Mironov V.A., General Director of Orintex LLC.

Expert opinion: The FAT for the discipline allows you to assess the level of competence formation. Start approbation.

5. The validity period of the FAT is determined by the period of implementation of the educational program.

1. Description of indicators and assessment criteria at various stages of their formation, description of assessment scales

Levels of competence formation(s), indicator(s)	Levels of competence formation			
	The minimum level has not been reached (Unsatisfactory) 2 points	Minimum level (satisfactory) 3 points	Intermediate level (good) 4 points	High level (excellent) 5 points
Competence: UK-8				
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 hostilities	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
ID-2 ^{UK-8} assesses the probability of potential danger in everyday life and professional activities and takes measures to prevent it	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
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.	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
Competency: PC-1				
ID-1 ^{PK-1} understands and is guided by the principles of construction and operation of communication networks, including their constituent subsystems, and	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations

signaling protocols, quality standards for data, voice and video transmission used in communication networks, in the legislation of the Russian Federation in the field of communications				
ID-2PC-1 analyzes statistical parameters of traffic, develops solutions for operational reconfiguration of the network, changing the parameters of the switching subsystem, network platforms, for the use of equipment for new technologies; changing and adjusting the parameters of the switching subsystem, transport networks and data transmission networks, for organizing new and expanding existing communication directions	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
ID-3PK-1. analyzes the statistics of the main performance indicators of radio systems and data transmission systems, develops measures to maintain them at the required level, and calculates the bandwidth of telecommunications networks.	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
ID-4PC-1 develops communication schemes and integration of new network elements, builds and expands the switching subsystem and network platforms; performs work on	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations

switching equipment, deploys service platform equipment, equipment of new technologies on the network, fulfills plans to expand existing equipment of network platforms and new technologies.				
<i>Competency: PC-2</i>				
ID-1PK-2 understands the basics of electrical engineering, network technologies, principles of operation, indicators of the use and functioning of telecommunication equipment, the requirements of technical regulations, international and national standards and other regulatory documents in the field of assessing the quality indicators of information and communication equipment	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
ID-2PK-2 complies with the requirements of programs and methods for conducting experimental tests of communication facilities and systems (information and communication equipment).	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
ID-3PC-2 works with software used in the processing of information of infocommunication systems and their components, technical means of data collection and processing, with various information systems and databases.	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations

ID-4PK-2 monitors the quality indicators of the information and communication equipment operation in accordance with their standard indicators	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
ID-5PK-2 to conduct experimental studies on the existing programs and methods of testing objects and communication systems (information and communication equipment) in order to assess their quality performance.	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
<i>Competency: PC-3</i>				
ID-1PK-3 understands regulatory, regulatory, technical, organizational and methodological documents that regulate the design preparation, implementation and operation of communication systems (telecommunication systems), the construction of facilities and communication lines	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
ID-2PC-3 operates with technologies used in the transport network, modern requirements for performance, availability, security, scalability, integration of technologies, manageability of communication systems (telecommunications) ; principles of planning the capacity of radio access networks	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations

ID-3PK-3 calculates the parameters and characteristics of the network and infocommunication facilities, analyzes their qualitative indicators based on statistics and radio measurements, and uses specialized design software.	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
ID-4PK-3 identifies and analyzes the advantages and disadvantages of design solutions, assesses the risks associated with the implementation of the project.	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
ID-5PK-3 collects initial data for the design of the network and infocommunication facilities, determination of the optimal configuration and topology of the transport network; develops technical solutions for the implementation of the communication system (telecommunication system) and its components.	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
ID-6PK-3 develops circuit design solutions for the components of radio-electronic facilities, selects the element base for the development of circuit solutions, conducts automated modeling and experimental work to check the technical characteristics of the modernized radio-electronic facilities.	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
<i>Competency: PC-4</i>				

ID-1PK-4 complies with the principles of a systematic approach in the design of communication systems (telecommunications) , infocommunication facilities and their components, requirements for the development of technical documentation.	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
ID-2PK-4 understands and is guided by the principles of construction and operation of infocommunication tools and their components, modern technical solutions for the implementation of communication systems (telecommunication systems) and its components, the software used.	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
ID-3PK-4 develops design documentation in accordance with standards and technical regulations; develops and submits presentation materials on the project.	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
ID-4PK-4 develops technical solutions for the creation of a communication system (telecommunication system) and its components; preparation of a communication organization scheme, equipment placement plan, passage scheme and other necessary documents; estimation of costs for the creation	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations

(modernization) of a communication system (telecommunication system).				
<i>Competency: PC-6</i>				
ID-1PC-6 understands the architecture and general principles of operation, hardware, software and hardware of the administered network, the procedure for configuring network elements of the infocommunication system	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
ID-2PK-6 uses modern standards in the administration of devices and software; uses standard and external software and hardware to monitor the performance of the network infrastructure of the administered network	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
ID-3PC-6 diagnoses failures and errors of network devices and software	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
ID-4PK-6 carries out routine maintenance on network devices and software of the infocommunication system	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations
ID-5PK-6 installs and configures system and application software necessary for the functioning of the IS in accordance with the work assignment, carries out standard design and	Unable to complete tasks related to this competency achievement indicator	Performs tasks at the reproductive level related to this indicator of competence achievement	Performs tasks related to this indicator of competence achievement in standard situations, making minor mistakes	Fully performs tasks related to this indicator of competence achievement, including in non-standard situations

parameterization of the IS in accordance with the regulations of the organization				
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2. Assessment tools for production technological (design and technological) practice

2.1. Tasks that allow you to assess the knowledge gained in practice

Emerging competencies, indicators	Task Statement	
UK-8 (ID-1UK-8, ID-2UK-8, ID-3UK-8) PK-1 (ID-1PK-1, ID-2PK-1, ID-3PK-1, ID-4PK-1) PC-2 (ID-1PK-2, ID-2PK-2, ID-3PK-2, ID-4PK-2, ID-5PK-2) PC-3 (ID-1PK-3, ID-2PK-3, ID-3PK-3, ID-4PK-3, ID-5PK-3, ID-6PK-3) PC-4 (ID-1PK-4, ID-2PK-4, ID-3PK-4, ID-4PK-4) PC-6 (ID-1PK-6, ID-2PK-6, ID-3PK-6, ID-4PK-6, ID-5PK-6)	Task 1	Study of literature on a given topic.
	Task 2	Choice of the method of experimental work.
	Task 3	Analysis of world experience in technical regulation on the subject of the study.

2.2. Tasks that allow you to assess the skills and abilities acquired in practice (basic level)

Emerging competencies, indicators	Task Statement	
UK-8 (ID-1UK-8, ID-2UK-8, ID-3UK-8) PK-1 (ID-1PK-1, ID-2PK-1, ID-3PK-1, ID-4PK-1) PC-2 (ID-1PK-2, ID-2PK-2, ID-3PK-2, ID-4PK-2, ID-5PK-2) PC-3 (ID-1PK-3, ID-2PK-3, ID-3PK-3, ID-4PK-3, ID-5PK-3, ID-6PK-3) PC-4 (ID-1PK-4, ID-2PK-4, ID-3PK-4, ID-4PK-4) PC-6 (ID-1PK-6, ID-2PK-6, ID-3PK-6, ID-4PK-6, ID-5PK-6)	Task 1	Performance of experimental research to solve research and production problems using modern equipment and research methods.
	Task 2	Formation of a technical solution on the topic of research.
	Task 3	Development of a methodology for mathematical modeling.
	Task 4	Preparation for a scientific and technical seminar based on the results of research.
	Task 5	Preparation of a publication (article).

3. Criteria for assessing competencies

An "excellent" grade is given to a student if the student has shown a deep, solid mastery of the internship program, while the tasks are completed in full, without errors with high quality.

A grade of "good" is given to a student if the student has shown a solid knowledge of the program educational material, while the tasks of the practice are completed competently, in a sufficiently complete volume, some inaccuracies or insignificant errors were made.

A "satisfactory" grade is given to a student if the student has shown knowledge of only the main part of the educational material of the internship without its particular details, while the tasks are not completed in full, errors or a number of minor inaccuracies are made.

The grade "unsatisfactory" is given to a student who has mastered a significant part of the program material of the practice at an insufficient level, while making gross mistakes, the tasks are not completed in full, significant mistakes have been made. An unsatisfactory grade is also given if there is no report on the completed task.

4. Description of the rating scale

The maximum amount of points for practice is set at 100 points and is converted into a grade according to a 5-point system in accordance with the scale:

Rating Score Compliance Scale with a 5-Point System

Rating Score	Score on a 5-point system
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88 – 100	Excellent
72 – 87	Good
53 – 71	Satisfactory
< 53	Unsatisfactory

5. Methodological materials that determine the assessment procedures and characterize the stages of competence formation

The internship procedure includes the following stages: preparatory, main, final. At each stage of the internship, current control over the process of competence formation is carried out.

The tasks provide for the mastery of competencies at different levels: basic and advanced.

The main evaluated elements (indicators) of the Internship are:

- Practice diary:

1) completeness of the content and quality of the practice diary;

2) feedback from the head of the internship from the department about the student's work in the process of internship;

- Internship report:

1) assessment of the content of the report on the completeness and correctness of the solution of the tasks;

2) assessment of the quality of the report.

In accordance with the University Regulation "On the Organization of the Educational Process on the Basis of the Rating System ...", the student's grade for the internship is given based on the results of the rating points scored. The maximum amount of points for the internship is set at 100 points and is distributed by the department according to the stages of work evaluated within the framework of current and intermediate control (submission of reporting documentation, defense of the internship report). The grade is given by the teacher-supervisor of the internship.