

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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ASSESSMENT TOOLS FOR THE DISCIPLINE (MODULE)
« Engineering ethics »

Field of study	<u>13.04.02 Electric Power Engineering and Electrical Engineering</u>
Specialization (Profile)	<u>Training Program of Electrical Engineering</u>
Year of commencement of studies	<u>2026</u>
Mode of study	<u>full-time</u>
Implemented in semester(s)	<u>1</u>

Foreword

1. Purpose: This assessment tools (AT) document is intended to assess the level of competency formation during ongoing progress control and intermediate assessment of students in the discipline "Engineering ethics".

2. The AT is an appendix to the syllabus of the discipline "Engineering ethics ".

3. Developer: Dmitry A. Kostyukov, Associate Professor of the Department of Automated Electric Power Systems and Power Supply.

4. The AT has undergone expert review.

Members of the expert group:

Chairperson: Yu. G. Kononov, Doctor of Technical Sciences, Professor, Head of the Department of Automated Electric Power Systems and Power Supply.

Committee members:

D.A. Kostyukov, Candidate of Technical Sciences, Associate Professor, Department of Automated Electric Power Systems and Power Supply.

A.V. Petrov, Candidate of Technical Sciences, Associate Professor, Department of Automated Electric Power Systems and Power Supply.

Representative of the employer organization:

S.A. Filippov, Candidate of Technical Sciences, Head of the Leninsky District Department of the Stavropol Interdistrict Branch of the PJSC «Stavropolenergosbyt».

Expert opinion: The AT is recommended for assessing the level of competency formation during ongoing progress control and intermediate assessment of students in the discipline "Engineering ethics".

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

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

Competency(ies), indicator(s)	Levels of competency formation			
	Minimum level not achieved (Unsatisfactory) – 2 points	Minimum level (Satisfactory) – 3 points	Medium level (Good) – 4 points	High level (Excellent) – 5 points
UC-2 Capable of managing a project at all stages of its life cycle				
Learning outcomes for the discipline (module): Indicator: ID-1 UC-2 Participates in project management at all stages of the project life cycle	Partially knows the ethical principles of engineering activities and experiences difficulties in identifying ethical issues arising during project implementation.	Has a general understanding of professional responsibility, safety requirements, and sustainable development principles in engineering projects.	Knows ethical principles of project activities and analyzes engineering decisions taking into account safety, social responsibility, and sustainability considerations.	Fully knows ethical approaches to project implementation and substantiates engineering decisions considering professional responsibility, safety, and sustainable development principles.
UC-3 Capable of organising and leading a team, developing a team strategy to achieve the set objective				
Learning outcomes for the discipline (module): Indicator: ID-1 UC-3 Demonstrates understanding of teamwork principles (knows roles within a team, types of leaders, and methods of workforce management)	Partially knows the principles of ethical communication and teamwork in engineering organizations.	Has a general understanding of ethical leadership, team roles, and professional communication principles.	Knows the principles of ethical leadership, teamwork, and responsible communication in engineering practice.	Fully knows the principles of ethical leadership, teamwork organization, and professional communication required for responsible engineering activities.
Learning outcomes for the discipline (module): Indicator: ID-2 UC-3 Leads team members to achieve the assigned task	Partially possesses the ability to make ethically justified decisions in professional interactions.	Has a general understanding of ethical decision- making and compliance with professional standards in teamwork.	Possesses the ability to apply ethical standards and responsible decision-making principles in professional interactions.	Fully possesses the ability to lead professional interactions in accordance with ethical standards and promote responsible decision-making in achieving project objectives.
UC-5 Capable of analysing and accounting for cultural diversity in the process of intercultural interaction				
Learning outcomes for the discipline (module): Indicator: ID-1 UC-5 Demonstrates understanding of the characteristics of different cultures and nations	Partially knows the influence of cultural values and ethical norms on engineering activities.	Has a general understanding of cultural diversity and professional ethical standards in international engineering environments.	Knows ethical norms, cultural values, and professional standards affecting engineering activities in diverse social environments.	Fully knows the influence of cultural diversity, ethical norms, and professional standards on engineering practice in international contexts.

Learning outcomes for the discipline (module): Indicator: ID-2 UC-5 Builds social interaction taking into account the commonalities and distinctions of different cultures and religions.	Partially possesses the skills of ethical interaction in multicultural environments.	Has a general understanding of intercultural communication and ethical interaction principles.	Possesses the skills of applying ethical principles and intercultural communication practices in professional interactions.	Fully possesses the skills of ethical communication and effective interaction within multicultural engineering teams and organizations.
UC-6 Capable of identifying and realising the priorities of one's own activities and ways of improving them based on self-assessment				
Learning outcomes for the discipline (module): Indicator: ID-1 UC-6 Assesses one's own resources and their limits (personal, situational, temporal), and uses them optimally to successfully complete an assigned task;	Partially knows the ethical responsibilities and professional obligations of engineers	Has a general understanding of personal responsibility and ethical conduct in engineering practice.	Knows the ethical responsibilities, professional obligations, and limitations affecting engineering decision-making.	Fully knows ethical responsibilities, professional obligations, and personal limitations and applies them in engineering practice.
Learning outcomes for the discipline (module): Indicator: ID-2 UC-6 Identifies the priorities of personal growth and ways to improve one's own activities based on self-assessment.	Partially possesses the ability to identify areas for professional and ethical development.	Has a general understanding of professional self-development and integrity principles.	Possesses the ability to identify priorities for professional and ethical development and apply integrity principles in engineering activities.	Fully possesses the ability to continuously improve professional and ethical competencies based on self-assessment and lifelong learning principles.
PC-1 Capable of participating in research and development activities in the field of electrical power engineering				
Learning outcomes for the discipline (module): Indicator: ID-4 PC-1 Prepares applications for industrial property objects.	Partially knows the principles of intellectual property ethics and responsible research conduct.	Has a general understanding of intellectual property protection and ethical requirements in engineering innovation activities.	Knows the principles of professional integrity, intellectual property ethics, and responsible research conduct in engineering activities.	Fully knows and applies the principles of professional integrity, intellectual property ethics, and responsible research conduct when preparing and protecting engineering innovations and intellectual property objects.

ASSESSMENT TOOLS FOR CHECKING THE LEVEL OF COMPETENCY FORMATION

Task No.	Correct Answer	Question Content	Competency
1.	2	Engineering ethics primarily studies: 1) mathematical methods of engineering calculations 2) moral principles and professional responsibilities in engineering practice 3) only the economic efficiency of engineering projects 4) only administrative procedures in organizations	UC-2
2.	1	According to professional engineering ethics, the primary obligation of an engineer is to: 1) hold paramount the safety, health, and welfare of the public 2) maximize the profit of the employer under any conditions 3) follow informal instructions even if they create danger 4) avoid responsibility for technical decisions	UC-2
3.	3	Deontological ethics focuses primarily on: 1) economic outcomes only 2) the personal benefit of the decision-maker 3) duties, rules, and obligations 4) technical efficiency without moral evaluation	UC-2
4.	2	Utilitarian ethics evaluates actions mainly by: 1) strict compliance with formal hierarchy 2) their consequences and overall benefit 3) personal loyalty to colleagues 4) the absence of written documentation	UC-2
5.	4	Virtue ethics emphasizes: 1) only written regulations 2) only project cost reduction 3) only technical documentation 4) moral character and professional virtues	UC-6
6.	1	Risk identification in engineering risk management means: 1) identifying possible hazards, events, and sources of risk 2) approving the project without analysis 3) ignoring unlikely events 4) replacing safety assessment with financial reporting	UC-2
7.	2	ISO 31000 is associated with: 1) patent classification only 2) principles, framework, and process for managing risk 3) rules for academic citation only	UC-2

		4) linguistic translation standards only	
8.	3	If an engineer's professional judgment is overruled under circumstances that endanger life or property, the ethically appropriate action is to: 1) remain silent in all cases 2) destroy technical records 3) notify the employer or client and, if necessary, appropriate authorities 4) approve the decision to avoid conflict	UC-2
9.	1	Safety ethics in energy systems primarily requires engineers to: 1) prevent harm to people, property, and the environment 2) increase operating risks to reduce costs 3) ignore low-probability hazardous events 4) prioritize speed over safety documentation	UC-2
10.	2	An ethically justified approach to safety management in an energy project is to: 1) postpone risk analysis until after commissioning 2) identify hazards and implement appropriate risk-control measures 3) exclude stakeholders from safety discussions 4) conceal known technical limitations	UC-2
11.	3	Sustainable development in engineering requires consideration of: 1) only short-term financial profit 2) only the interests of the project contractor 3) environmental, social, and economic consequences 4) only the speed of project implementation	UC-2
12.	1	Environmental responsibility in the energy sector means: 1) minimizing adverse environmental impacts while meeting energy needs 2) ignoring emissions and resource use 3) rejecting all technical innovations 4) considering only the internal interests of the company	UC-2
13.	4	Ethical evaluation of an energy project should include assessment of its impact on: 1) only the project budget 2) only the technical team 3) only equipment suppliers 4) affected communities, workers, users, and the environment	UC-2
14.	2	A life-cycle perspective in engineering ethics means considering: 1) only the design stage 2) consequences from design and operation to maintenance and disposal 3) only the purchase price of equipment 4) only the final report after project completion	UC-2
15.	1	A conflict of interest occurs when: 1) personal or private interests may improperly influence professional judgment 2) an engineer performs calculations carefully 3) a team member asks a technical question	UC-3

		4) a project follows approved standards	
16.	2	The ethically appropriate way to handle a conflict of interest is to: 1) conceal it from all participants 2) disclose and properly manage or avoid it 3) use it for personal advantage 4) continue the work without informing anyone	UC-3
17.	3	Whistleblowing in engineering ethics refers to: 1) routine reporting of completed work 2) informal discussion of personal preferences 3) reporting serious safety, legal, or ethical violations through appropriate channels 4) refusal to document technical risks	UC-3
18.	1	Professional integrity requires engineers to: 1) present data and conclusions honestly and accurately 2) change results to satisfy management expectations 3) hide calculation errors from stakeholders 4) use another author's work without attribution	UC-6
19.	2	Bribery in engineering practice is: 1) an acceptable tool for accelerating project approval 2) offering or accepting an improper benefit to influence a decision 3) a normal form of technical review 4) a method of improving public safety	UC-3
20.	4	Accountability in the use of artificial intelligence in energy systems means that: 1) no person or organization is responsible for AI-based decisions 2) AI systems may operate without oversight 3) technical decisions do not require explanation 4) responsibility for decisions, results, and consequences can be identified	UC-2
21.	2	Algorithmic bias means: 1) the absence of data in a system 2) systematic unfairness caused by data, model design, or implementation 3) manual calculation of engineering parameters 4) the physical failure of electrical equipment	UC-5
22.	1	Data privacy in digital energy systems is related to: 1) protection of data from unauthorized access, disclosure, or misuse 2) increasing public access to all confidential records 3) eliminating cybersecurity measures 4) replacing ethical review with automation	UC-2
23.	3	Transparency in AI-supported engineering decisions helps to ensure that: 1) decisions cannot be reviewed 2) responsibility is avoided 3) decision logic and relevant factors can be explained or traced 4) all technical documentation is removed	UC-2

24.	4	Cybersecurity in digitalized energy systems has ethical significance because cyber failures may affect: 1) only document formatting 2) only the appearance of software interfaces 3) only academic terminology 4) safety, reliability, and public welfare	UC-2
25.	2	Intercultural interaction in engineering practice requires taking into account: 1) only technical drawings 2) commonalities and differences of cultures and religions 3) only the nationality of equipment manufacturers 4) only one communication style for all situations	UC-5
26.	1	In a multicultural engineering team, ethically appropriate professional behavior includes: 1) respectful communication, clarification of expectations, and consideration of cultural differences 2) ignoring communication barriers 3) excluding minority viewpoints from discussion 4) using stereotypes as a basis for assigning tasks	UC-5
27.	3	Global engineering ethics requires engineers to: 1) ignore local social conditions 2) replace safety standards with personal preferences 3) consider local contexts while maintaining professional responsibility and public safety 4) apply different safety principles depending on personal benefit	UC-5
28.	2	Ethical leadership in an engineering team involves: 1) suppressing discussion of safety concerns 2) organizing roles, supporting responsible communication, and promoting ethical decisions 3) avoiding accountability for team outcomes 4) giving priority to informal pressure over professional judgment	UC-3
29.	1	Ethical communication in teamwork requires information to be: 1) truthful, relevant, respectful, and professionally justified 2) deliberately incomplete 3) adjusted to hide risks 4) based only on personal assumptions	UC-3
30.	4	A stakeholder in an engineering project is: 1) only the chief engineer 2) only the equipment supplier 3) only the financial department 4) a person, group, or organization affected by or able to affect the project	UC-2
31.	2	Self-assessment of an engineer's professional activity includes evaluation of: 1) only the opinions of competitors 2) one's own resources, limitations, competencies, and responsibilities 3) only the project budget 4) only the formal job title	UC-6
32.	1	A patent is primarily used to protect:	PC-1

		1) a technical invention 2) a personal opinion 3) an informal meeting agenda 4) a cultural tradition without technical content	
33.	2	Plagiarism in research and engineering work means: 1) using properly cited sources 2) using another person's work, ideas, or text without proper acknowledgment 3) preparing original calculations 4) reporting test results honestly	PC-1

2. Description of the grading scale

Within the framework of the rating system, student performance in each discipline is assessed during ongoing progress control and intermediate assessment. The rating system for assessing student knowledge is based on the use of a set of control measures (checkpoints) for testing the material covered, optimally located throughout the entire time interval of studying the discipline. The principles of the rating system for assessing student knowledge are based on the provisions described in the "Regulations on the organization of the educational process based on the rating system for assessing student knowledge" at North Caucasus Federal University.

The rating assessment system is not provided for students studying in master's degree programs, or for students studying in bachelor's degree programs by correspondence or part-time (evening) forms of study.

3. Criteria for assessing competencies

The grade "Excellent" is awarded to a student who has deeply and firmly mastered the program material, presents it exhaustively, consistently, clearly, and logically coherently, is able to closely link theory with practice, handles tasks, questions, and other types of knowledge application with ease, and does not struggle to answer when assignments are modified.

The grade "Good" is awarded to a student who has a solid command of the material, presents it competently and substantively without making significant inaccuracies in answering questions, correctly applies theoretical principles to practical questions and tasks, and possesses the necessary skills and techniques for their execution.

The grade "Satisfactory" is awarded to a student who has knowledge of only the basic material but has not mastered its details, makes inaccuracies, insufficiently correct formulations, and violates logical sequence in presenting the program material.

The grade "Unsatisfactory" is awarded to a student who does not know a significant part of the program material and makes substantial errors.