

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)
« Artificial Intelligence (AI)".»**

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 "Artificial Intelligence (AI)".

2. The AT is an appendix to the syllabus of the discipline "Artificial Intelligence (AI)".

3. Developer: A.A.Stepanova, Candidate of Technical Sciences, Associate Professor at 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.

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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 "Artificial Intelligence (AI)".

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-1. Capable of conducting critical analysis of problem situations based on a systems approach and developing an action strategy				
Learning outcomes for the discipline (module): Indicator: ID-1 UC-1 Searches for the required information, performs its critical analysis, and consolidates the analysis results to solve the assigned task	Fails to find required information or uses irrelevant sources; does not perform critical analysis or accepts information uncritically; unable to solve the task or provides an incorrect solution.	Finds basic minimum information from limited sources; performs superficial analysis mostly describing rather than evaluating; provides a standard solution meeting minimum requirements.	Finds relevant and sufficient information; performs solid critical analysis with minor omissions; consolidates results into a correct, well- structured solution.	Independently finds comprehensive, high-quality sources; performs deep critical analysis evaluating reliability and applicability; consolidates results into a well-justified, original solution.
PC-3. Capable of managing the power system operating mode of an electrical power supply system using digital technologies				
Learning outcomes for the discipline (module): Indicator: ID-3 PC-3. Applies knowledge of digital technologies in the processes of generation, transmission, and distribution of electrical energy;	Fails to apply digital technologies to power system processes; lacks basic knowledge of digital tools in the energy sector; cannot solve the assigned task.	Applies basic digital technologies to simple tasks in power generation, transmission, or distribution; requires instructor guidance when dealing with complex scenarios.	Confidently applies standard digital tools to manage power processes; correctly selects and uses technologies for typical generation, transmission, and distribution tasks with only minor inaccuracies.	Expertly applies advanced digital technologies to optimize generation, transmission, and distribution; proposes innovative, well- justified solutions for complex power system operating modes.

ASSESSMENT TOOLS FOR CHECKING THE LEVEL OF COMPETENCY FORMATION

Task No.	Correct Answer	Question Content	Competency
1.	2	What does the Turing test evaluate in the context of artificial intelligence? 1. The ability of a machine to physically interact with objects 2. The ability of a machine to exhibit behavior indistinguishable from that of a human 3. The speed of processing large volumes of data 4. The ability of a machine to learn independently without labels	PC-3, UC-1
2.	2	How does Artificial Narrow Intelligence (ANI) differ from Artificial General Intelligence (AGI)? 1. ANI runs only on supercomputers, while AGI runs on standard PCs 2. ANI solves specific narrow tasks, while AGI is capable of understanding, learning, and applying intelligence to any task, just like a human 3. ANI does not use machine learning, while AGI does 4. ANI exists only in theory, while AGI is already widely used in industry	PC-3, UC-1
3.	2	For which class of problems does classical AI most often use the Minimax algorithm? 1. Clustering tasks for unstructured data 2. Adversarial game tasks (zero-sum games) 3. Linear regression tasks 4. Natural language processing tasks	PC-3, UC-1
4.	2	What is a "state space" in problem-solving via search? 1. The amount of RAM required for the algorithm to run 2. The set of all possible configurations (states) of the problem and the valid transitions between them 3. A graphical user interface for visualizing a neural network 4. The space of weight coefficients inside a neural network	PC-3, UC-1

5.	1	What is the main difference between supervised learning and unsupervised learning? 1. Supervised learning uses labeled data (with known correct answers), while unsupervised learning uses unlabeled data 2. Supervised learning requires human intervention during the prediction stage, while unsupervised learning does not 3. Supervised learning is used only for neural networks, while unsupervised learning is used for linear models 4. In supervised learning, the model receives a reward from the environment, while in unsupervised learning, it receives a penalty	PC-3, UC-1
6.	2	What is "overfitting" of a machine learning model? 1. The model is too simple and cannot capture patterns even in the training set 2. The model performs perfectly on training data but generalizes poorly and makes errors on new (test) data 3. The process of training a model for too long due to a lack of computational power 4. A situation where too few features are added to the model	PC-3, UC-1
7.	2	What is the "Random Forest" algorithm? 1. A single deep decision tree with a large number of levels 2. An ensemble of multiple decision trees trained on subsets of data and features, whose predictions are averaged 3. A clustering method based on data density 4. A neural network imitating the structure of a forest array	PC-3, UC-1
8.	1	Which algorithm is a classic clustering method that requires the number of clusters (k) to be specified in advance? 1. K-Means 2. Support Vector Machine (SVM) 3. Gradient Boosting 4. Logistic Regression	PC-3, UC-1

9.	2	What is the main role of activation functions (e.g., ReLU or Sigmoid) in neural networks? 1. They normalize input data to the range [0, 1] 2. They introduce non-linearity into the network, allowing it to approximate complex dependencies 3. They accelerate the convergence of the backpropagation algorithm 4. They prevent model overfitting	PC-3, UC-1
10.	2	What is the backpropagation algorithm? 1. A method for initializing neural network weights before training begins 2. An algorithm for computing the gradient of the loss function with respect to the network weights for their subsequent update 3. The process of removing "extra" neurons from the network to speed up processing 4. A data augmentation method to increase the size of the training set	PC-3, UC-1
11.	2	What is XAI (Explainable AI) in the context of modern AI systems? 1. Expert systems based on rules (eXpert AI) 2. Methods and approaches that make the decisions of "black boxes" (complex models) understandable and interpretable for humans 3. Algorithms for accelerating neural network training (eXtreme AI) 4. Generation of synthetic data for training (X-data AI)	PC-3, UC-1
12.		The _____ test evaluates a machine's ability to exhibit intelligent behavior that is indistinguishable from that of a human.	PC-3, UC-1
13.		Algorithmic _____ is the systematic and unfair distortion of AI results that disadvantages specific groups of people.	PC-3, UC-1
14.		Modern AI development trends are associated with the emergence of Foundation Models and Large Language Models (LLMs) trained on massive arrays of _____ data.	PC-3, UC-1
15.		In search-based problem solving, the _____ is the set of all possible configurations of the problem and the valid transitions between them.	PC-3, UC-1
16.		_____ is a situation where a machine learning model "memorizes" the training data too well but performs poorly on new, previously unseen examples.	PC-3, UC-1

17.		Random Forest is a machine learning _____ that combines multiple decision trees to improve prediction accuracy and robustness.	PC-3, UC-1
18.		_____ is an unsupervised machine learning task where objects are divided into groups so that objects within the same group are similar to each other.	PC-3, UC-1
19.		The _____ algorithm is used to compute the gradient of the loss function with respect to the weights of a neural network in order to update them during training.	PC-3, UC-1
20.		The "Transformer" architecture in natural language processing is based on the _____ mechanism, which allows the model to consider the context of all words in a sentence simultaneously.	PC-3, UC-1
21.		In a _____ adversarial network (GAN), one part of the model (the generator) creates data, while the other (the discriminator) tries to distinguish the generated data from real data.	PC-3, UC-1
22.		_____ (Explainable AI) is a set of methods and approaches aimed at making the decisions of complex AI models ("black boxes") understandable and interpretable for humans.	PC-3, UC-1
23.		Artificial Intelligence is:	PC-3, UC-1
24.		Algorithmic bias is:	PC-3, UC-1
25.		Ontology (in the context of AI) is:	PC-3, UC-1
26.		A heuristic function is:	PC-3, UC-1
27.		Machine learning is:	PC-3, UC-1
28.		Overfitting is:	PC-3, UC-1

29.		Clustering is:	PC-3, UC-1
30.		A neural network is:	PC-3, UC-1
31.		Reinforcement learning is:	PC-3, UC-1
32.	A-3, B-2, C-1	Match the type of artificial intelligence with its description: Types of AI: A) Narrow AI (ANI) B) General AI (AGI) C) Superintelligent AI (ASI) Descriptions: 1. A hypothetical AI that surpasses the best human capabilities in all areas—from science and creativity to social communication. 2. An AI capable of understanding, learning, and applying intelligence to solve any tasks at a human level or above. 3. An AI specializing in solving one specific narrow task (e.g., image recognition or playing chess).	PC-3, UC-1
33.	A-1, B-2, C-3, D-4	Match the classical AI algorithm with its purpose: Algorithms: A) A* (A-star) B) Minimax C) Depth-First Search (DFS) D) Breadth-First Search (BFS) Purposes: 1. Finding the shortest path in a graph using a heuristic function to estimate the distance to the goal. 2. A decision-making algorithm in adversarial games that minimizes the possible loss. 3. A graph traversal algorithm that explores branches as deeply as possible before backtracking. 4. A graph traversal algorithm that explores all neighboring vertices of the current level before moving to the next one.	PC-3, UC-1

34.	A-2, B-4, C-3, D-1	Match the type of machine learning with its characteristic: Types of Learning: A) Supervised Learning B) Unsupervised Learning C) Reinforcement Learning D) Semi-supervised Learning Characteristics: 1. The model is trained on a small amount of labeled data and a large amount of unlabeled data. 2. The model is trained on labeled data, where the correct answer is known for each input example. 3. The agent learns by trial and error, interacting with the environment and receiving rewards for actions. 4. The model identifies hidden structures and patterns in unlabeled data without pre-known answers.	PC-3, UC-1
35.	A-3, B-4, C-1, D-2	Match the neural network architecture with its key feature: Architectures: A) Convolutional Neural Network (CNN) B) Recurrent Neural Network (RNN) C) Transformer D) Generative Adversarial Network (GAN) Features: 1. An architecture that uses the self-attention mechanism for parallel processing of the entire input sequence; the foundation of modern LLMs. 2. An architecture consisting of a generator that creates data and a discriminator that distinguishes it from real data. 3. An architecture that uses convolutional layers for the efficient recognition of spatial patterns (e.g., images). 4. An architecture with recurrent connections, allowing it to process sequential data while retaining information about previous steps.	PC-3, UC-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.