

MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION
Federal State Autonomous Educational Institution
higher education
NORTH CAUCASIAN FEDERAL UNIVERSITY

I APPROVE

Dean of the Faculty of Mathematics
and computer science named after
Professor N.I. Chervyakov,
Candidate of Physical and
Mathematical Sciences, Associate
Professor
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ASSESSMENT TOOLS FUND FOR DISCIPLINE

Artificial intelligence technology / Технология искусственного интеллекта

Direction of training	02.04.01 Mathematics and Computer Science
Profile	Training Program for Electronic Information
Year of commencement of studies	<u>2026</u>
Form of study	full-time
Implemented in the 2nd semester	

Introduction

1. Purpose: The assessment tools fund is intended to provide a methodological basis for organizing and conducting ongoing assessments in the course "Artificial intelligence technology / Технология искусственного интеллекта." Ongoing assessments in this course are a systematic method for assessing students' knowledge, skills, and abilities. The objectives of ongoing assessments are to obtain initial information on the progress and quality of competencies acquired, as well as to stimulate regular, targeted student work. This work is intended to develop a certain level of competencies.

2. FOS is an appendix to the program of the discipline "Artificial intelligence technology / Технология искусственного интеллекта"

3. Developer: Department of Computational Mathematics and Cybernetics .

4. An examination of the organophosphorus compounds was carried out.

Members of the expert group:

Chairman

Babenko M. G., Head of the Department of Computational Mathematics and Cybernetics

Members of the commission:

Peleshenko V.S., Associate Professor of the Department of Computational Mathematics and Cybernetics

Peleshenko T. A., Associate Professor of the Department of Computational Mathematics and Cybernetics

Representative of the employer organization Kornienko S. A., head of the branch department FSUE "Main Radio Frequency Center" in the Southern and North Caucasian Federal Districts districts

Expert opinion: the assessment tool fund complies with the educational program in the field of study 02.04.01 Mathematics and Computer Science, profile "Artificial intelligence technology / Технология искусственного интеллекта" and is recommended for ongoing monitoring of students' academic performance and midterm assessment.

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

1. Description of the criteria for assessing competence at various stages of its development, description of assessment scales

Competence(s), indicator(s)	Levels of development of competencies			
	The minimum level has not been reached (Unsatisfactory) 2 points	Minimum level (satisfactorily) 3 points	Intermediate level (Fine) 4 points	High level (excellent) 5 points
Competence: OPK-1. Able to find, formulate and solve current and significant problems in applied and computer mathematics				
ID-1 _{OPK-1} Finds and formulates significant problems of applied and computer mathematics. ID-2 _{OPK-1} Knows and uses methods for solving significant problems of applied and computer mathematics.	does not know the basic methods of using the main programming languages, program development methods, standards for the design of program documentation in artificial intelligence systems cannot choose among existing mathematical methods the most suitable for solving a specific applied problem in artificial intelligence systems	has a satisfactory knowledge of the basic methods of using the main programming languages, program development methods, and standards for the design of program documentation in artificial intelligence systems satisfactorily able to select among existing mathematical methods the most suitable for solving a specific applied problem in artificial intelligence systems	has a good knowledge of the basic methods of using the main programming languages, program development methods, and standards for the design of program documentation in artificial intelligence systems is good at selecting among existing mathematical methods the most suitable for solving a specific applied problem in artificial intelligence systems	has excellent knowledge of the basic methods of using the main programming languages, program development methods, and standards for the design of program documentation in artificial intelligence systems is excellent at selecting among existing mathematical methods the most suitable for solving a specific applied problem in artificial intelligence systems
Competence: PC-7. Able to create and explore new mathematical models in the natural sciences, industry and business, taking into account the capabilities of modern information technology, programming and computer equipment				
ID-1 _{PC-7} With the help of modern information technologies, explores newly created	does not know how to collect, process and interpret experimental	has satisfactory ability to collect, process and	is proficient in collecting, processing and interpreting experimental	is excellent at collecting, processing, and interpreting experimental

mathematical models in the natural sciences of industry; ID-2 PC-7 Conducts Parallel Computer and Network Technologies as part of his professional activities ID-3 PC-7 Uses modern programming languages and application software packages to implement specific algorithms and mathematical models	data necessary for design and production-technological activities in artificial intelligence systems does not use modern data processing methods in the field of information technology in artificial intelligence systems	interpret experimental data necessary for design and production-technological activities in artificial intelligence systems satisfactorily uses modern methods of data processing in the field of information technology in artificial intelligence systems	data necessary for design and production-technological activities in artificial intelligence systems has a good knowledge and uses modern methods of data processing in the field of information technology in artificial intelligence systems	data necessary for design, production, and technological activities in artificial intelligence systems has excellent knowledge and uses modern methods of data processing in the field of information technology in artificial intelligence systems
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The assessment of the level of forced competence in a discipline is carried out on the basis of the "Regulations on the current monitoring of academic performance and midterm assessment of students in higher education programs - bachelor's programs, specialist programs, master's programs - at the Federal State Autonomous Educational Institution of Higher Education "North Caucasus Federal University" in the current version.

ASSESSMENT TOOLS FOR CHECKING THE LEVEL OF DEVELOPMENT OF COMPETENCIES

Task number	Correct answer	Contents of the question	Competence
		Form of study - full-time, Semester 2	
1.	a	The creation of the first computers and neurocomputers marked the beginning a) the fourth information revolution b) the first information revolution c) the second information revolution d: third information revolution	OPK-1, PC-7
2.	Frank Rosenblatt	Perceptrons were invented Frank Rosenblatt Alan Turing Aristotle _____ (type the correct version without quotation marks)	OPK-1, PC-7
3.	a	Heuristic programming reduces the running time of programs by a) improving the computer algorithm for solving the problem b) the use of high-performance computers c) training personnel to work with a given user computer program	OPK-1, PC-7
4.	basic rules of mathematical logic	Logical systems of artificial intelligence are based on the ideas of application "basic rules of mathematical logic" artificial neural networks Bayesian rules of logical inference _____ (type the correct version without quotation marks)	OPK-1, PC-7
5.	graph theory	Semantic networks are based on the ideas of application graph theory artificial neural networks Bayesian rules of logical inference _____ (type the correct version without quotation marks)	OPK-1, PC-7
6.	a	Multilayer artificial neural networks are based on the ideas of application a) applied mathematical methods for finding a local minimum of a function of several variables b) Bayesian rules of logical inference	OPK-1, PC-7

		c) the basic rules of mathematical logic	
7.	above human	Deep learning of artificial neural networks allows to achieve the level of image recognition "above human" "at the human level" "below human" _____ (type the correct version without quotation marks)	OPK-1, PC-7
8.	creation of fundamentally new scientific and technical products	Advanced artificial intelligence methods are those that aim to " creation of fundamentally new scientific and technical products" "improvement of existing scientific and technical products" "destruction of existing scientific and technical products" _____ (type the correct version without quotation marks)	OPK-1, PC-7
9.	Computer vision	The technological task "High-speed identification of a large number of objects in various parts of the electromagnetic spectrum" refers to the tasks Computer vision Natural Language Processing "Advanced Methods of Artificial Intelligence" _____ (type the correct version without quotation marks)	OPK-1, PC-7
10.	Computer vision	The technological task "Analysis of information about remote objects using active optical systems" refers to the tasks Computer vision Natural Language Processing "Advanced Methods of Artificial Intelligence" _____ (type the correct version without quotation marks)	OPK-1, PC-7
11.	Natural language processing	The technological task "Extracting facts from texts and systematizing them" refers to the tasks Natural Language Processing "Advanced Methods of Artificial Intelligence" Computer vision _____ (type the correct version without quotation marks)	OPK-1, PC-7
12.	selecting the next line in a dialogue based on context	Tasks of dialogical intelligence " selecting the next line in a dialogue based on context" "selecting the next image in a dialogue based on context"	OPK-1, PC-7

		"selecting the next fact from the knowledge base in a dialogue based on context" _____ (type the correct version without quotation marks)	
13.	search, identification and classification of advertising	Tasks of intelligent information retrieval "search, detection and classification of advertising" "destruction of advertising from the Internet" "modification with minimal user participation of Internet advertising" _____ (type the correct version without quotation marks)	OPK-1, PC-7
14.	Natural language processing	The technological task "Grouping information and constructing flowcharts based on text data" refers to the tasks Natural Language Processing "Advanced Methods of Artificial Intelligence" Computer vision _____ (type the correct version without quotation marks)	OPK-1, PC-7
15.	Natural language processing	The technological task "Dynamic recognition of meaning" refers to the tasks Natural Language Processing "Advanced Methods of Artificial Intelligence" Computer vision _____ (type the correct version without quotation marks)	OPK-1, PC-7
16.	Speech recognition and synthesis	The technological task "Recognition of complex semantic constructions and slang in speech" refers to the tasks Speech Recognition and Synthesis "Advanced Methods of Artificial Intelligence" Natural Language Processing _____ (type the correct version without quotation marks)	OPK-1, PC-7
17.	Intelligent decision support systems	The technological task "Predictive and prescriptive analysis" refers to the tasks "Intelligent decision support systems" Speech Recognition and Synthesis Natural Language Processing _____ (type the correct version without quotation marks)	OPK-1, PC-7
18.	Intelligent decision support systems	The technological task "Forecasting the quality of manufactured products" refers to the tasks "Intelligent decision support systems" Speech Recognition and Synthesis	OPK-1, PC-7

		Natural Language Processing _____ (type the correct version without quotation marks)	
19.	Intelligent decision support systems	The technological task “Personnel management, monitoring of productivity, psychophysical condition and searching for opportunities to optimize personnel workload” refers to the tasks " Intelligent decision support systems" Speech Recognition and Synthesis Natural Language Processing _____ (type the correct version without quotation marks)	OPK-1, PC-7
20.	a	Limitations of natural language processing systems a) the availability of a large amount of information for training is mandatory b) the impossibility of graphical visualization of the results of natural language processing c) the impossibility of audio accompaniment of the results of natural language processing	OPK-1, PC-7
21.	a	Limitations of intelligent decision support systems a) the need for multi-stream input of a large amount of diverse data b) the lack of “working” mathematical models of intelligent decision support systems c) the almost complete absence of computer programs for intelligent decision support systems	OPK-1, PC-7
22.	people	Moral and ethical limitations of artificial intelligence systems concern, first of all, "people" robots "organizations" _____ (type the correct version without quotation marks)	OPK-1, PC-7
23.	a	The Three Laws of Robotics a) A robot may not injure a human being or, through inaction, allow a human being to come to harm b) A robot may cause harm to a human being or, through inaction, allow a human being to come to harm c) A robot has the right to decide whether or not to harm a person or, through its inaction, to allow harm to come to a person.	OPK-1, PC-7
24.	a	The Three Laws of Robotics	OPK-1, PC-7

		a) A robot may not harm humankind or, through inaction, allow humankind to come to harm b) A robot may cause harm to humanity or, through inaction, allow harm to come to humanity c) The robot has the right to decide the fate of humanity or, through inaction, allow harm to come to humanity if it deems it necessary.	
25.	Promising methods of artificial intelligence	The technological task "Using quantum computers to accelerate the solution of artificial intelligence problems" refers to the tasks "Advanced Methods of Artificial Intelligence" "Intelligent decision support systems" Natural Language Processing _____ (type the correct version without quotation marks)	OPK-1, PC-7
26.	Promising methods of artificial intelligence	The technological task "Using artificial intelligence for designing complex objects (systems, robots, algorithms)" refers to the tasks "Advanced Methods of Artificial Intelligence" "Intelligent decision support systems" Natural Language Processing _____ (type the correct version without quotation marks)	OPK-1, PC-7
27.	Promising methods of artificial intelligence	The technological task "Learning by doing or by analogy" refers to the tasks "Advanced Methods of Artificial Intelligence" "Intelligent decision support systems" Natural Language Processing _____ (type the correct version without quotation marks)	OPK-1, PC-7
28.	Promising methods of artificial intelligence	The technological task "Processing highly noisy signals" refers to the tasks "Advanced Methods of Artificial Intelligence" "Intelligent decision support systems" Natural Language Processing _____ (type the correct version without quotation marks)	OPK-1, PC-7
29.	reduce the running time of a complex algorithm	Heuristic programming allows "reduce the running time of a complex algorithm" "increase the running time of a complex algorithm" "does not affect the running time of a complex algorithm" _____ (type the correct version without quotation marks)	OPK-1, PC-7

30.	unique within the frame	The name of a slot in a frame-based knowledge representation model must be "unique within the frame" "unique to the entire model" "all slots in the frame model are anonymous" _____ (type the correct version without quotation marks)	OPK-1, PC-7
31.	a	The Turing Test a) successfully passed the computer tests in different countries of the world b) has not yet been tested by the computer c) only domestically assembled computers passed the test successfully	OPK-1, PC-7
32.	a	Natural language processing a) is actively used in solving artificial intelligence problems b) this problem is still considered difficult to solve and has no practical implementation on computers	OPK-1, PC-7
33.	maintain a free dialogue with a person in a high-quality manner	Speech recognition and synthesis systems still cannot "to maintain a high-quality, free-form dialogue with a person" "synthesize emotionally charged speech" "recognize a noisy audio stream" _____ (type the correct version without quotation marks)	OPK-1, PC-7
34.	a	Synthesis (generation) of three-dimensional, two-dimensional images and video objects a) this is one of the priority areas of artificial intelligence development in Russia b) is a rarely used technology, but it may find application in the future c) this technology is used exclusively abroad; in Russia it is prohibited by law	OPK-1, PC-7
35.	a	Automation of neural network training a) this is one of the priority areas of artificial intelligence development in Russia b) is a rarely used technology, but it may find application in the future c) this technology is used exclusively abroad; in Russia it is prohibited by law	OPK-1, PC-7

Competency assessment criteria *

"excellent" grade is awarded to a student who demonstrates a deep and comprehensive *knowledge* of the subject, presents the material in a coherent and logical manner, *is able to* accurately and logically justify a point of view, and *has a confident* command of methodological concepts and accepted symbols.

"good" grade is given to a student if he demonstrates a solid *knowledge* of the subject and presents the material in a reasoned manner;

knows how to apply knowledge to analyze specific situations, but at the same time slightly violates the sequence of presentation of the material, provides an insufficiently complete, although correct, definition of concepts;

has a command of basic methodological concepts and symbols.

"satisfactory" grade is given to a student if he or she *knows* the subject in general, but presents the program material fragmentarily and inconsistently;

knows how to apply his knowledge in practice, allows for individual mistakes and errors when solving problems;

a poor *command* of basic mathematical concepts and the use of mathematical symbols.

The grade **"unsatisfactory"** is given to a student if he has not sufficiently mastered the main content of the subject and shows *ignorance* of most of the educational material, makes gross errors in formulating definitions and concepts;

is not able to logically analyze and solve practical problems;

does not have sufficient knowledge of mathematical symbols and their correct application.