

Ministry of Science and Higher Education of the Russian Federation
NATIONAL RESEARCH
TOMSK STATE UNIVERSITY (NR TSU)

Institute of Applied Mathematics and Computer Science

APPROVE:
Director



A. V. Zamyatin

Evaluation materials of the current control and intermediate certification in the discipline

(Evaluation tools by discipline)

Intelligent Systems – I

in the major of training

01.04.02 Applied mathematics and informatics

Orientation (profile) of training:

Big Data and Data Science

ET was implemented:

Dr. tech. sciences, Professor,

Professor of the Department of Theoretical Foundations
of Informatics



V.G. Spitsyn

Reviewer:

Dr. tech. sciences, Professor,

Head of the Department of Applied Informatics



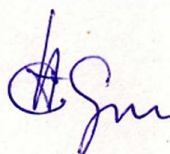
S.P. Sushchenko

Evaluation tools were approved at the meeting of the educational and methodological
commission of the Institute of Applied Mathematics and Computer Science (EMC IAMCS).

Protocol dated 22.05.2025 № 1

Chairman of the EMC IAMCS,

Dr. tech. sciences, Professor



S.P. Sushchenko

Evaluation tools (ET) are an element of the system for assessing the formation of competencies among students in general or at a certain stage of its formation.

The ET is developed in accordance with the work program (WP) of the discipline.

1. Competencies and training outcomes, obtained upon the discipline mastery

Competencies	Competence indicator	Code and name of planned training outcomes that characterize the stages of competency formation	Criteria for evaluating training outcomes			
			Excellent	Good	Satisfactory	Unsatisfactory
UK-1. Able to carry out a critical analysis of problem situations based on a systematic approach, develop an action strategy	IUK-1.1 Identifies a problem situation, on the basis of a systematic approach, carries out its multifactorial analysis and diagnostics.	MR-1.1.1. The student will be able to: - find and use sources of additional information to improve the level of general and professional knowledge; - to select and process information on the chosen research topic; correctly quote and make references to the sources used in written works; - be able to apply natural science and mathematical knowledge to solve scientific and engineering problems in the field of informatics and computer technology.	90-100 points	70-89 points	55-69 points	0-54 points
	IUK-1.2 Carries out the search, selection and systematization of information to determine alternative options for strategic solutions in a problem situation.					

	IUK-1.3 Suggests and justifies the strategy of action, taking into account the limitations, risks and possible consequences.					
GPC-1. Able to solve actual problems of fundamental and applied mathematics.	IGPC -1.1 Analyzes problems in the field of fundamental and applied mathematics.	MR-1.1.2. The student will be able to: - develop means of implementing information technologies (methodological, informational, mathematical, algorithmic, technical and software) - to conduct experimental studies according to a given methodology and analyze the results. - perform processing and analysis of data obtained in theoretical and experimental studies.				

2. Stages of competency formation and types of evaluation tools

№	Stages of competency formation (discipline sections)	Code and name of training outcomes	Type of evaluation tool (tests, assignments, cases, questions, etc.)
1.	Sections 1. Introduction to intelligent systems 2. Knowledge representation models. 3. Architecture and technology for the development of expert systems.	RD 1 The student will be able to apply natural science and mathematical solutions to scientific and engineering problems in the field of informatics and computer technology.	Tests, questions for colloquia, assignments for laboratory work
2.	4. Fuzzy logic. 5. Application of fuzzy sets in expert systems.	RD 2 The student will have the ability to develop means of implementing information technologies (methodological, informational, mathematical, algorithmic, technical and software)	Tests, questions for colloquia, assignments for laboratory work

3. Typical control tasks or other materials necessary for the assessment of educational training outcomes

3.1. Typical tasks for conducting ongoing monitoring of progress in the discipline: tests, questions for colloquia, assignments for laboratory work.

3.2. Typical tasks for conducting intermediate certification in the discipline.

Questions for credit with an assessment:

1. Describe the production model of knowledge representation.
2. Give a block diagram of the rule interpreter.
3. Describe the frame model of knowledge representation.
4. Describe the semantic model of knowledge representation.
5. Give a block diagram that describes the stages of technology for creating expert systems.
6. Give a block diagram describing the structure of connections between the subsystems of the expert system.
7. Shortleaf's scheme for determining the degree of confidence in the hypothesis.
8. Describe the concept of a cardinal number for a fuzzy set.
9. Describe the Jaeger measure that characterizes the degree of fuzziness of the set.
10. Describe the entropy measure of the fuzziness of the Kosko set.
11. Describe the generalized Gaussian membership function.
12. Describe the Mamdani-Zade fuzzy inference system.

4. Methodological materials that determine the procedures for evaluating training outcomes

4.1. Methodological materials for assessing the current control of progress in the discipline.

The current control takes into account the student's performance of laboratory work and answers to questions at colloquia. The points scored on a 100-point scale are taken into account during the intermediate certification.

4.2. Methodological materials for conducting intermediate certification in the discipline.

The results of the assessment with an assessment are determined by the marks "excellent", "good", "satisfactory", "unsatisfactory".

The points scored during the current control are taken into account during the intermediate certification. Grades "excellent", "good", "satisfactory", "unsatisfactory" are given with the number of points scored: 90-100, 70-89, 55-69 and 0-54, respectively.