Syllabus
«Knowledge-oriented technologies of computational intelligence »

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Expected learning outcomes
As a result of studying the discipline, the student
must know:

- the main forms and laws of abstract logical thinking, the basics of fuzzy logic, forms of knowledge presentation;
- methods, methods and technologies of collecting information from various sources, analyzing and processing data and knowledge;
- instrumental means of presentation and processing of intellectual data and knowledge, models of knowledge presentation, methods of knowledge formation and their characteristics;
- solving methods using a knowledge-oriented approaches.

must be able to:

- implement the learned concepts, concepts, theories and methods in intellectual and practical activities in the field of intellectual information systems;
- to determine the consistency of expert judgments in the formation of knowledge;
- to develop knowledge-oriented systems for solving tasks;
- use expert evaluation methods using fuzzy logic and a knowledge-oriented approach to solve decision-making and computational intelligence problems.

The scope of the discipline: 3,5 ECTS credits (12 hours of lectures, 24 hours of practice).

Purpose: teaching students the ability to apply various methods and tools for solving problems in the conditions of linguistic (qualitative) knowledge-oriented data processing. Mastering the course material should provide students with a theoretical base in the field of knowledge engineering and artificial (computational) intelligence and form the basic skills of users and developers of modern systems based on expert knowledge. Also, the goal of education is to provide students with systematized knowledge about methods, systems and technologies used in the processes of developing knowledge-oriented systems.

The content of the discipline

Topic 1. Knowledge representation in a fuzzy form. Basic concepts and definitions. Operations with fuzzy intervals.
Topic 2. Knowledge in different fuzzy forms.
Topic 3. Knowledge representation modelsФайл.
Topic 4. Hesitant fuzzy information processing based on the generalized aggregation of resulting trapezoidal linguistic terms for solving knowledge-oriented problems.
Topic 5. Fuzzy Analytic Hierarchy Process and its peculiarities in knowledge processing.
Topic 6. Fuzzy VIKOR method for knowledge-oriented systems.
Topic 7. Fuzzy knowledge-oriented TOPSIS method for solving multi-criteria decision-making problems.

Evaluation criteria of laboratory works / practices / individual works / reports / projects

Maximum number of points – a student with high quality independently performed the entire scope of work, answers all questions related to the work performed, and makes additional

Prerequisites
"Fuzzy Sets Theory and Fuzzy Logic", "Decision Making Theory".

Consequences
The knowledge gained during the discipline can be used in the disciplines or areas "Intelligent decision support systems", "Software intelligent control systems", "Methods of computational intelligence".

Technical support
Practices on the discipline are carried out in computer classes using Microsoft Visual Studio, Java SE, Python, C#.

Deadline policy
Works that are submitted in violation of deadlines without good reason are evaluated at a lower grade.

Academic Integrity Policy
Provides independent performance of practices. Write-off (including using mobile devices) is prohibited. The work is not credited in case of detection of plagiarism or write-off.

calculations, for example, using knowledge-oriented technologies offered to him by the teacher. The teacher has no complaints about the software implementation and performance requirements.
Approximately 70%-99% of the maximum number of points – a student with sufficient quality independently completed all tasks, but in the process he made some mistakes, which, after pointing to them by the teacher, corrected themselves. He answers some questions with a slight error. The additional calculations offered by the teacher make with some complexity. Not all work requirements are met.
Approximately 40%-69% of the maximum number of points – a student of average quality independently completed all tasks, but did not meet all the requirements for implementation. He answers the question with a slight error. The additional calculations offered by the teacher, for example, using knowledge-oriented technologies of decision making makes with insignificant errors. Not all requirements for the design of the work are met.
Approximately 1%-39% of the maximum number of points – a student performed all the work independently, but the quality of implementation is insufficient (errors in calculations, not all work requirements are met). The answers to the questions about the work are not entirely clear. There are errors in the answers.
0 points – a student did not perform the entire amount of work, or performed with gross errors. He has problems with calculations by certain methods, does not know the theoretical material, the software implementation does not meet the requirements.