<table>
<tr><td>Course code</td><td></td></tr>
<tr><td>Type and description</td><td>EC</td></tr>
<tr><td>ECTS credit</td><td>1</td></tr>
<tr><td>Course name</td><td>Fuzzy logic</td></tr>
<tr><td>Course name in Polish</td><td>Logika rozmyta</td></tr>
<tr><td>Language of instruction</td><td>English</td></tr>
<tr><td>Course level</td><td>8 PRK</td></tr>
<tr><td>Course coordinator</td><td>Adam Niewiadomski</td></tr>
<tr><td>Course instructors</td><td>Adam Niewiadomski</td></tr>
<tr><td>Delivery methods and course duration</td><td>
<table>
<tr><th></th><th>Lecture</th><th>Tutorials</th><th>Laborato-ry</th><th>Project</th><th>Seminar</th><th>Other</th><th>Total of teaching hours during semester</th></tr>
<tr><td>Contact hours</td><td>0</td><td></td><td></td><td>15</td><td></td><td></td><td>15</td></tr>
<tr><td>E-learning</td><td>No</td><td>No</td><td>No</td><td>No</td><td>No</td><td>No</td><td></td></tr>
<tr><td>Assess-ment criteria (weight-age)</td><td></td><td></td><td></td><td>100%</td><td></td><td></td><td></td></tr>
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<tr><td>Course objective</td><td>To make students familiar with theory and chosen applications of fuzzy sets, with elements of theory and architecture of systems for recognition, detection, identification, interpretation, classification and representation of information.</td></tr>
<tr><td>Learning outcomes</td><td>A student graduating from this course:

1. DEFINES elements and basic tasks of fuzzy sets and systems.

2. SELECTS AND DETERMINES computational methods, especially artificial intelligence methods for knowledge representations with fuzzy sets.

3. ANALYZES AND JUDGES the choice of parameters of AI computer programs that operate on sample sets of data.

4. PROJECTS AND PARAMETRIZES algorithms and software for fuzzy systems.</td></tr>
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	5. ASSESSES and COMPARES performance of fuzzy systems and their methods. Learning outcomes: W4, U4, K1.
Assessment methods	Evaluation of project, presentation
Prerequisites	–
Course content with delivery methods	An introduction to methods of artificial intelligence from the point of view of data representation, the Turing test. Crisp sets and mltivalued sets, multivalued logics, fuzzy logic. Definitions for fuzzy sets, membership function as an extension of characteristic function. Full and partial membership. Semantic and syntactic relation to the classic set theory. Fuzzy relations and their properties, examples. Reflexive, transitive, symmetric and locally reflexive fuzzy relations. Similarity relations, neighbourhood relations, fuzzy equivalence and fuzzy equality, Poincare's paradox. Basic characteristics of fuzzy sets: support, cardinality, alpha-cuts, kernel. Triangular norms, intersection, union and complement of fuzzy sets. Linguistic variables, modifiers `very' and `more-or-less'. The connectives OR, AND, NOT. Fuzzy quantifiers, relative and absolute. Properties of fuzzy quantifiers. General and existential quantifier as fuzzy quantifiers. Linguistically quantified statements, degrees of truth. Linguistic summaries of databases by Yager. Elements of a summary, degree of truth. Compound summarizers, qualifiers. Quality measures of summaries. The optimal summary.
Basic reference materials	1. J. M. Mendel. Uncertain Rule-Based Fuzzy Logic Systems: Introduction And New Directions. Prentice-Hall, Upper Saddle River, NJ, 2001. 2. Niewiadomski, A., Methods for the Linguistic Summarization of Data Applications of Fuzzy Sets and Their Extensions. EXIT Publishing House, 2008, Warsaw
Other reference materials	Current publications on Advances in Fuzzy Logic
Average student workload outside classroom	15 h
Comments	
Last update	07-03-2023