

Tárgytematika / Course Description Logic

GKNM_INTA056

Tárgyfelelős neve /

Teacher's name: dr. Fullér Róbert

Félév / Semester: 2025/26/1

Beszámolási forma /

Assesment: Vizsga

Tárgy heti óraszám /

Teaching hours(week): 2/2/0

Tárgy féléves óraszám /

Teaching hours(sem.): 0/0/0

OKTATÁS CÉLJA / AIM OF THE COURSE

We study the basic chapters of mathematical logic emphasizing on the wider application of logical tools in computing.

TANTÁRGY TARTALMA / DESCRIPTION

A short history of mathematical logic. The subject and the goal of logic. Propositional logic. Logical values and operations. Logical expressions, tautologies and truth tables.

Logical connectives and operations. Quantifiers. Operator precedence.

Inference rules: Modus Ponens and Modus Tollens.

Proof by contradiction. Proof by induction. Set-theoretical approach to logic.

Relations between set-theoretical and logical operations. Multi-valued logics. Fuzzy logic.

Boolean logic versus fuzzy logic.

Fuzzy implications. Fuzzy rule-based systems.

Fuzzy reasoning schemes: Simplified, Mamdani, Tsukamoto, Takagi-Sugeno, Larsen. Practical applications of fuzzy logic. Knowledge-based expert systems. Reasoning methods in knowledge-based systems.

SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESSMENT'S METHOD

A state-of-the-art survey of a selected topic. The survey should be of 16-20 pages.

KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

Smullyan Raymond M., What is the Name of This Book? The Riddle of Dracula and Other Logical Puzzles, Dover Publication Inc., 2011. ISBN 9780486481982

Robert Fullér, [PDF] Neural Fuzzy Systems, Abo Akademistryckeri, Abo, ESFSeries A:443, 1995, 249 pages. [ISBN 951-650-624-0, ISSN 0358-5654]

AJÁNLOTT IRODALOM / RECOMMENDED MATERIAL