Study programme(s): Mathematics	
Level: doctoral studies	
Course title: Fuzzy set theory 1 (AL-13)	
Lecturer: Branimir M. Šešelja	
Status: optional	
ECTS: 10	
Requirements: none	

Learning objectives

Acquiring knowledge in basics of fuzzy set theory and in most important applications.

Learning outcomes

Minimal: Understanding fundamental notions of fuzzy set theory and their properties.
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desirable : To be able to solve individually and creatively advanced problems in fuzzy set theory and also to apply the knowledge creatively.

Syllabi

Ordering, lattice, complete lattice, residuated lattice and properties. T-norms, t-conorms.
Lattice-valued (fuzzy) sets. Basic notions: cut-sets, decomposition and synthesis, decomposition theorems, extension principle. Fuzzy logic.
Fuzzy relations and properties. Relational equations, special fuzzy relations, their properties and application. Approximate reasoning, fuzzy systems, fuzzy controllers.
Fuzzy algebraic structures (fuzzy algebras, groups, rings, lattices).

Literature

1. Klir, G., Yuan B.: Fuzzy sets and fuzzy logic, Prentice Hall P T R, New Jersey, 1995.
2. S. Gottwald: Fuzzy Sets and fuzzy logic, Vieweg 1993.
3. Gerla, G.: Mathematical Tools for Approximate Reasoning, Kluwer Academic Publishers, Dordrecht 2001.
4. R. Belohlavek: Fuzzy relational systems, Kluwer Academic Publishers,
   1. Dordrecht 2002.

Weekly teaching load				Other: 0
Lectures: 2	Exercises 0	Other forms of teaching: 0	Student research: 6	

Teaching methodology

Theoretical lessons with examples; permanent interaction and communication with students.

Grading method (maximal number of points 100)			
Pre-exam obligations	**points**	**Final exam**	**points**
Colloquia	50	Written exam	50