Program	Level	Second cycle
	Name of the program	Theoretical Computer Science

COURSE

Course title	**Fuzzy Logic**			
Course code	Semester	Course status	ECTS	Contact hours (L+AE+LE)
CS 540	III	Elective course	7	3+2+0

Lecturer	
Course Goals	- The main goal of the module is to introduce students to the basics of fuzzy logic and its applications in solving various practical problems.
Learning Outcomes	After passing the module, students will master: - the basic concepts of fuzzy sets; - operations with fuzzy sets; - theory of approximate reasoning; - fuzzy models.

COURSE CONTENT

- Basic and fundamental concepts of fuzzy sets. Fuzzy sets: representations, semantics and operations. Fuzzy relations and the corresponding operations. Principle of extension. Fuzzy arithmetic. A measure of fuzziness. Linguistic variables and probability distributions.
- Operations with fuzzy sets. Intersections and unions of fuzzy sets. Non-monotone fuzzy operations. Aggregation operators. OWA operators. Linguistic quantifiers. Fuzzy measures and integrals.
- Approximate reasoning theory (fuzzy logic). Elements of approximate reasoning: semantics, deduction, binary logic. Fuzzy proportions. Inference rules. Rules of composition. Representations. Completeness and consistency of inference rules.
- Fuzzy models. Fuzzy relational databases. Fuzzy functional and multivalued dependencies. Some equivalences between fuzzy relational database models and fuzzy logic. Applications of fuzzy systems.

LITERATURE

1. Dž. Gušić, Aksiomatizacija Fuzzy i Vague Funkcionalnih i Višeznačnih Zavisnosti u Relacijama Baza Podataka, Prirodno-matematički fakultet Univerziteta u Sarajevu, Sarajevo, 2021.
2. Y. Shi, A Deep Study of Fuzzy Implications, PhD Dissertation, Ghent University, Ghent, 2009.
3. M. Baczynski and B. Jayaram, Fuzzy Implications, Springer-Verlag, Berlin Heidelberg, 2008.

STUDENT WORKLOAD (hours in a semester)

Lectures	45	Exercises	30	Individual work	100	T o t a l	175

GRADING			REMARKS	
Criterion	Maximum points	Minimum points		
Midterm exams	100	55		
Final exam	100	55		
T o t a l	100	55		