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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | **Faculty of Sciences and Mathematics** |
| **GENERAL INFORMATION** |
| Study program  | Computer Science, Mathematics |
| Study Module (if applicable) |  |
| Course title | Fuzzy Sets and Systems |
| Level of study | [ ] Bachelor [ ]  Master’s [x]  Doctoral |
| Type of course | [ ]  Obligatory [x]  Elective |
| Semester  |  [ ]  Autumn [ ] Spring |
| Year of study  |  |
| Number of ECTS allocated | 12.00 |
| Name of lecturer/lecturers | Jelena Ignjatović |
| Teaching mode |  [x] Lectures [ ] Group tutorials [ ]  Individual tutorials [ ] Laboratory work [ ]  Project work [ ]  Seminar [ ] Distance learning [ ]  Blended learning [ ]  Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| Presentation of the basic ideas, concepts and results of the theory of fuzzy sets and systems, with algebraic foundations of fuzzy logic, as well as the introduction of practical applications of fuzzy sets and methods for solving fuzzy relational equations and inequalities. At the end of the course, students would master the basic ideas, concepts and results of the theory of fuzzy sets and systems, and they would be able to apply practically their knowledge in individual scientific researches within the same or within some other scientific fields. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| **Fuzzy sets** - notion of a fuzzy set, set and algebraic operations of fuzzy sets; **Fuzzy relations** - composition of fuzzy relations, fuzzy orders, fuzzy equivalences and fuzzy equalities, fuzzy partitions; **Fuzzy functions** - extensionality, fuzzy matrices, fuzzy closures; **Algebraic foundations of fuzzy logic** - Residuated lattices, Heyting algebras, BL-algebras, MV-algebras, Gödel algebras, triangular norms on the unit interval, a Lukasiewicz, product and Gödel norm; **Applications of fuzzy sets** - Modeling of vagueness, fuzzy logic and approximate reasoning, fuzzy control, fuzzy data analysis, fuzzy clustering, fuzzy decision making, fuzzy languages ​​and fuzzy automata, fuzzy algebraic structures, fuzzy relational systems, fuzzy graphs, fuzzy topological spaces; **Effective methods for solving the fuzzy relational equations and inequalities, as well as their systems**. |
| **LANGUAGE OF INSTRUCTION** |
| [x] Serbian (complete course) [ ]  English (complete course) [ ]  Other \_\_\_\_\_\_\_\_\_\_\_\_\_ (complete course)[ ] Serbian with English mentoring [ ] Serbian with other mentoring \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **ASSESSMENT METHODS AND CRITERIA** |
| **Pre exam duties** |  **Points** | **Final exam** |  **Points** |
| **Activity during lectures** | **10** | **Written examination** | **--** |
| **Practical teaching** | **--** | **Oral examination** | **70** |
| **Teaching colloquia** | **20** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |