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| **UNIVERSITY OF NIŠ** | | | | | | |
| **Course Unit Descriptor** | | **Faculty** | | | Faculty of Sciences and Mathematics | |
| **GENERAL INFORMATION** | | | | | | |
| Study program | | | | **Computer Science** | | |
| Study Module (if applicable) | | | |  | | |
| Course title | | | | Symbolic computation | | |
| Level of study | | | | Bachelor  Master’s  Doctoral | | |
| Type of course | | | | Obligatory  Elective | | |
| Semester | | | | Autumn Spring | | |
| Year of study | | | | 3 | | |
| Number of ECTS allocated | | | | 8 | | |
| Name of lecturer/lecturers | | | | Predrag S. Stanimirović | | |
| Teaching mode | | | | Lectures Group tutorials  Individual tutorials  Laboratory work  Project work  Seminar  Distance learning  Blended learning  Other | | |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** | | | | | | |
| *Introduction to the basic ideas, concepts and results of symbolic computation. Possibility of package MATHEMATICA in symbolic computation and data manipulation. Apply symbolic processing in main algorithms.* | | | | | | |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** | | | | | | |
| **Basic concepts:** Computer Algebra systems. Integers. Rational number arithmetic. Polynomials: Elementary operations on polynomials. Single variable polynomials. Multivariate polynomials. Polynomial division and expansions. Polynomial decomposition. Polynomial simplification. Automatic simplification and expression structure. **MATHEMATICA as programming language:** Expressions and values of expressions. Prefix, postfix and infix notation. Lists. Patterns. Transformation Rules and Definitions. Functions and Programs. Functional operations. **Simplification.** Transformation rules and definitions. Functional operations. Functions as the first order data types. Repetitive applications of functions. Applications of functions on lists and other expressions. Pure functions. Higher order functions. **Solving equations and inequalities.** Complex polynomial systems. The MATHEMATICA functions Reduce, Resolve, and FindInstance; Advanced string patterns: Regular expressions and string expressions. **Dynamic interactivity. Linear algebra.** | | | | | | |
| **LANGUAGE OF INSTRUCTION** | | | | | | |
| 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** | | | **20** |
| **Practical teaching** |  | | **Oral examination** | | | **50** |
| **Teaching colloquia** | **20** | | **OVERALL SUM** | | | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** | | | | | | |