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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Science and Mathematics |
| **GENERAL INFORMATION** |
| Study program  | **Mathematics** |
| Study Module (if applicable) |  |
| Course title | Numerical solution of stochastic differential equations |
| Level of study | ☐Bachelor ☐ Master’s x Doctoral |
| Type of course | ☐ Obligatory x Elective |
| Semester  |  ☐ Autumn xSpring |
| Year of study  | II |
| Number of ECTS allocated | 12 |
| Name of lecturer/lecturers | Prof. dr Marija Milošević |
| Teaching mode |  xLectures ☐Group tutorials ☐ Individual tutorials ☐Laboratory work ☐ Project work ☐ Seminar ☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| *Acknowledging numerical approximation methods for stochastic differential equations. Students should be able to apply numerical approximation methods for stochastic differential equations.* |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| BASIC CONCEPTS OF NUMERICAL APPROXIMATIONS OF SOLUTIONS TO STOCHASTIC DIFFERENTIAL EQUATIONS: Euler approximation; Approximation of moments of solutions to stochastic differential equations; Weak and strong convergence of numerical methods; Convergence rate of numerical methods; Stability of numerical solutions. STRONG APPROXIMATIONS: Euler, Milstein and Taylor approximation methods; Ito-Taylor approximations; Stratonovich-Taylor approximations; Some explicit and implicit strong approximations; Multistep numerical methods; Numerical simulations. WEAK APPROXIMATIONS: Some explicit and implicit weak approximations; Convergence of numerical solutions to the exact solution of stochastic differential equation. |
| **LANGUAGE OF INSTRUCTION** |
| xSerbian (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** |  | **Written examination** | **35** |
| **Practical teaching** |  | **Oral examination** | **35** |
| **Teaching colloquia** | **30** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |