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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 | Stochastic Differential Equations |
| Level of study | ☐Bachelor ☐ Master’s x Doctoral |
| Type of course | ☐ Obligatory x Elective |
| Semester  |  ☐ Autumn xSpring |
| Year of study  | I |
| Number of ECTS allocated | 12 |
| Name of lecturer/lecturers | Prof. dr Miljana Jovanović |
| Teaching mode |  xLectures ☐Group tutorials ☐ Individual tutorials ☐Laboratory work ☐ Project work ☐ Seminar ☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| *Fundamental knowledge in stochastic Ito integrals and stochastic differential equations. Students are prepared to study various problems in the theory of stochastic differential equations and to apply the Ito calculus in some other disciplines.* |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| • Brownian motion.• The Ito integral. The Ito formula, moment inequalities.• Stochastic differential equations. Existence-and-uniqueness theorems.• The Caratheodory's and Euler-Maruyama's approximate solutions.• Linear stochastic differential equations.• Stability of stochastic differential equations.• Ito processes. The Girsanov's theorem.• Stochastic integrals and stochastic differential equations with respect to martingales and martingale measures. |
| **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** |