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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) | Module in physics |
| Course title | Integral equations and special functions |
| Level of study |  Bachelor x Master’s ☐ Doctoral |
| Type of course | ☐ Obligatory x Elective |
| Semester  | x Autumn ☐Spring |
| Year of study  | The second year |
| Number of ECTS allocated | 7.5 |
| Name of lecturer/lecturers | Dijana V. Mosić |
| Teaching mode | xLectures ☐Group tutorials ☐ Individual tutorials☐Laboratory work ☐ Project work ☐ Seminar☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| *The students will master the techniques of solving integral equations and using special functions for solving various theoretical and practical problems.* |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| **Integral equations: Basic types of linear integral equations – Volterra and Fredholm integral equations. Existence of solution. Fredholm alternative.****Solving and application of integral equations: Method of successive approximations. Меthod of iterated kernel - resolvent. Fredholm integral equation with degenerate kernel. Some applications of integral equations.** **Solving integral equations applying Laplace transform.** **Gamma and Beta functions.****Orthogonal polynomials: Оrthogonality, complete orthogonal system, integral representation, Rodrigues’ formula, recurrence formulae, norms and differential equations.****Classical orthogonal polynomials: Legendre, Chebyshev, Jacobi, Lager, Hermite polynomials, generalized polinomials.****Bessel functions, hypergeoremtic functions.** |
| **LANGUAGE OF INSTRUCTION** |
| xSerbian (complete course) ☐ English (complete course) ☐ Other \_\_\_\_\_\_\_\_\_\_\_\_\_ (complete course)☐Serbian with English mentoring ☐Serbian with other mentoring \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **ćASSESSMENT METHODS AND CRITERIA** |
| **Pre exam duties** | **Points** | **Final exam** | **points** |
| **Activity during lectures** |  | **Written examination** | **40** |
| **Practical teaching** | **10** | **Oral examination** |  |
| **Teaching colloquia** | **50** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |