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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of sciences and mathematics |
| **GENERAL INFORMATION** |
| Study program  | **Mathematics** |
| Study Module (if applicable) |  |
| Course title | Functional analysis |
| Level of study | x☐Bachelor ☐ Master’s ☐ Doctoral |
| Type of course | x☐ Obligatory ☐ Elective |
| Semester  |  ☐ Autumn x ☐Spring |
| Year of study  | 3 |
| Number of ECTS allocated | 7.50 |
| Name of lecturer/lecturers | Snežana Živković-Zlatanović |
| Teaching mode |  x☐Lectures ☐Group tutorials ☐ Individual tutorials ☐Laboratory work ☐ Project work ☐ Seminar ☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| *Acquiring general knowledge and concepts of functional analysis as well as enabling students to successfully apply it in other courses.* |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Banach spaces: definitions of normed spaces and Banach spaces, product of normed spaces, examples of normed spaces and Banach spaces, quotient space; bounded linear operators; series; equivalent norms; separability; compactness; compact operators.The Hahn-Banach theorem and corollaries, the open mapping theorem and corollaries, the Banach-Steinhaus theorem and corollaries. Dual operators.Hilbert spaces: definition and basic property; examples; the P.Jordan-J. Von Neumann theorem; ortogonality; the orthogonal decomposition theorem; the Riesz theorem; Bessel’s inequality, Parseval’s equality, Hilbert basis; the Gram-Schmidt process.  |
| **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** | **0** | **Written examination** | **0** |
| **Practical teaching** | **0** | **Oral examination** | **50** |
| **Teaching colloquia** | **50** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |