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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** | | | | | | |