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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) | General Mathematics  |
| Course title | Measures of Non-Compactness and Applications |
| Level of study | [ ] Bachelor [x]  Master’s [ ]  Doctoral |
| Type of course | [ ]  Obligatory [x]  Elective |
| Semester  |  [ ]  Autumn [x] Spring |
| Year of study  | 1 |
| Number of ECTS allocated | 6 |
| Name of lecturer/lecturers | Nebojša Č. Dinčić |
| Teaching mode |  [x] Lectures [ ] Group tutorials [ ]  Individual tutorials [ ] Laboratory work [ ]  Project work [ ]  Seminar [ ] Distance learning [ ]  Blended learning [ ]  Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| Mastering the fundamental concepts of compactness, non-compactness and their applications. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| The compact sets in metric spaces. Kuratowski measure of noncompactness: basic properties, Kuratowski theorem, Furi-Vignoli theorem. Hausdorff measure of noncompactness, its properties and Hausdorff distance. Axiomatic approach to measures of noncompactness; Darbo fixed point theorem. Compact and finite rank operators. Operator measures of noncompactness and calculating the measures of noncompactness for some bounded subsets and operators on some sequence spaces. The ascent and descent of operator and Fredholm theorems for operators which Hausdorff measure is less than 1. Some applications of measures of noncompactness. |
| **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** |  | **Written examination** |  |
| **Practical teaching** |  | **Oral examination** | **50** |
| **Teaching colloquia** | **50** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |