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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 | Fredholm and Riesz operators |
| Level of study | ☐Bachelor ☐ Master’s x☐ Doctoral |
| Type of course | ☐ Obligatory x☐ Elective |
| Semester  |  ☐ Autumn ☐Spring |
| Year of study  | 1 |
| Number of ECTS allocated | 12 |
| 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)** |

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| *Acquiring general knowledge and concepts of Fredholm theory* *as well as enabling students to successfully apply it in other topics of theory of operators and functional analysis.* |

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| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Nullity and defect. Semi-Fredholm and Fredholm operators. Connections with the Calkin algebra. Left and right Fredholm operators. Ascent and descent of operators. Browder operators. Openness of the set of Fredholm operators and the set of proper semi-Fredholm operators. Semi-Fredholm domain. Perturbation classes. Upper and lower Weyl operators. Left and right Weyl operators. Riesz operators. Kato type decomposition theorem. Upper and lower semi-Browder operators. Left and right Browder operators. Corresponding essential spectra. The boundaries of the essential spectra. The essential spectral radius and semi-Fredholm radius. Perturbations of the essential spectra. Zemanek's method of removing the jumping points. |
| **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** | **70** |
| **Teaching colloquia** | **30** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |