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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Sciences and Mathematics |
| **GENERAL INFORMATION** |
| Study program  | Physics |
| Study Module (if applicable) |  |
| Course title | Mathematics I |
| Level of study | [x] Bachelor [ ]  Master’s [ ]  Doctoral |
| Type of course | [x]  Obligatory [ ]  Elective |
| Semester  |  [x]  Autumn [ ] Spring |
| Year of study  | 1 |
| Number of ECTS allocated | 8 |
| 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)** |
| An introduction to some basic principles of Mathematical Logic, Algebra, Linear algebra, Mathematical analysis and Analytic geometry. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Brief introduction to mathematical logic and set theory: propositional calculus, quantifiers, sets, relations (binary relations, equivalence and partial order), functions. Equivalent sets and cardinality of sets. Algebraic structures: groupoids, semigroups, quasigroups, groups, rings and fields. Properties of some important sets: natural numbers and integers, rational numbers, real numbers and complex numbers. Ring of polynomials: algebraic operations, division of polynomials, factoring polynomials, roots of polynomial, rational functions. Linear algebra: vector space, the base and the dimension of vector space; vector subspaces and spans; geometric vectors; linear operators; basics of matrix theory, rank and determinants. Matrix of linear operator. Solving systems of linear equations. Dot product, cross product, and mixed double product of vectors.Analytic geometry in three-dimensional space: straight line and the plane in space, their mutual positions and the surfaces of the second order in space. |
| **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** | **10** | **Written examination** | **40** |
| **Practical teaching** |  | **Oral examination** |  |
| **Teaching colloquia** | **50** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |