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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 | | | | Bachelor  Master’s  Doctoral | | |
| Type of course | | | | Obligatory  Elective | | |
| Semester | | | | Autumn Spring | | |
| Year of study | | | | 1 | | |
| Number of ECTS allocated | | | | 8 | | |
| Name of lecturer/lecturers | | | | Nebojša Č. Dinčić | | |
| Teaching mode | | | | 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** | | | | | | |
| 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** | | | | | | |