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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) | Mathematical models in physics |
| Course title | Tensor calculus |
| Level of study | ☐Bachelor x ☐ Master’s ☐ Doctoral |
| Type of course | x☐ Obligatory ☐ Elective |
| Semester  |  ☐ Autumn x☐ Spring |
| Year of study  | 1 |
| Number of ECTS allocated | 7.5 |
| Name of lecturer/lecturers | Mića Stanković |
| Teaching mode |  x☐Lectures ☐Group tutorials ☐ Individual tutorials ☐Laboratory work ☐ Project work ☐ Seminar ☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| *Introduction to Riemann spaces and tensors.* |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| **INTRODUCTION. Systems of magnitudes and operations with them, basic definitions and operations with systems.****Some special magnitude systems. Basic algebraic structures. Affine spaces. Euklidean and pseudo Euclidean space.****TENSOR ALGEBRA. Transformation of variables. Invariants and tensors of the first order. Tensors of higher order. Relative tensors.** **RIEMANNIAN SPACES. Definition of Riemannian space. Covariant and contravariant metric tensor. Some examples of the relative tensor. Lifting and lowering of the index. Scalar product. Christoffel symbols. The covariant derivative of a tensor. Parallel move and geodesic lines. The Ricci curvature tensor and Ricci identity. Frenet formulas.** |
| **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** | **6** | **Written examination** | **0** |
| **Practical teaching** | **0** | **Oral examination** | **40** |
| **Teaching colloquia** | **54** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |