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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Science and Mathematics |
| **GENERAL INFORMATION** |
| Study program  | **Physics** |
| Study Module (if applicable) |  |
| Course title | Chapters of Didactics and Physics Education |
| Level of study | ☐Bachelor ☐ Master’s ☒ Doctoral |
| Type of course | ☐ Obligatory ☒ Elective |
| Semester  |  ☐ Autumn ☒Spring |
| Year of study  | 1 |
| Number of ECTS allocated | 15 |
| Name of lecturer/lecturers | Ljubiša D. Nešić |
| Teaching mode |  ☒Lectures ☐Group tutorials ☐ Individual tutorials ☐Laboratory work ☒ Project work ☒ Seminar ☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| *Introduction to Theory of Gravity based on General Relativity.* |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| **Principle of equivalence. Curvilinear coordinates. Types of intervals. The covariant derivative. Motion of particle in gravitational field. Constant gravitational field. Curvature tensor and its properties. The action for the gravitational field. Energy-momentum tensor. Einstein's equations. Newton's law. Spherically-symmetric gravitational field. The movement in the spherically-symmetric gravitational field. Weak gravitational waves. Homogeneous and isotropic space. Closed and open models of the universe. The gravitational red shift.****Hamiltonian formulation of general relativity. 3 + 1 decomposition of space-time.** |
| **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** | **20** | **Written examination** |  |
| **Practical teaching** |  | **Oral examination** | **60** |
| **Teaching colloquia** | **20** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |