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| **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty** | Faculty of Mechanical Engineering |
| **GENERAL INFORMATION** |
| Study Program | **Mechanical Engineering** |
| Study Module (if applicable) | - |
| Course Title |  Analysis and simulation of tire dynamics |
| Level of Study | ☐ Bachelor | ☐ Master’s | ☒ Doctoral |
| Type of Course | ☐ Obligatory | ☒ Elective |
| Semester | ☐ Autumn | ☒ Spring |
| Year of Study | III |
| Number of ECTS Allocated | 10 |
| Name of Lecturer/Lecturers | Miloš S. Stojković |
| Teaching Mode | ☒ Lectures | ☒ Group tutorials | ☐ Individual tutorials |
| ☒ Laboratory work | ☒ Project work | ☒ Seminar |
| ☐ Distance learning | ☐ Blended learning | ☐ Other |
| **Purpose and Overview (max. 5 sentences)** |
| *To provide students with the necessary level of knowledge on modern methods in tire stress analysis using FEM and simulation of tire dynamics, in order to prepare them for future research in the field. Knowledge and skills acquired during the course are recommended for the position of leading tire designer or tire testing engineer.* |
| **Syllabus (brief outline and summary of topics, max. 10 sentences)** |
| 1) Nonlinearities in FEM based stress analysis of tires, 2) Rubber modeling for use FEA of tires, 3) Modeling of textile and steel cord for use in FEA of tires, 4) Geometrical tire models suitable for tire FEA, 5) FEM models of tires, 6) Simulation of tire inflation process using axisymmetric FEM model, 7) Tire footprint analysis (stress analysis of statically loaded tire), 8) Breaking and cornering analysis, 9) Steady-state cornering analysis, 10)*Study research* along with instructions of a professor, supervisor and, optionally, assigned consultant from the tire company, 11) Study visit to a tire company |
| **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** | **5** | **Written Examination** | **0** |
| **Practical Teaching** | **0** | **Oral Examination** | **25** |
| **Teaching Colloquia** | **70** | **Overall Sum** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |