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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Electronic Engineering |
| **GENERAL INFORMATION** |
| Study program  | Control systems |
| Study Module (if applicable) | Computer Control Systems and Measurement Techniques |
| Course title | Modelling and Simulation in Automotive Industry |
| Level of study | ☐Bachelor ⊠ Master’s ☐ Doctoral |
| Type of course | ☐ Obligatory ⊠ Elective |
| Semester  |  ⊠ Autumn ☐Spring |
| Year of study  | first |
| Number of ECTS allocated | 4 |
| Name of lecturer/lecturers | Antić S. Dragan, Milojković T. Marko |
| Teaching mode |  ⊠Lectures ☐Group tutorials ☐ Individual tutorials ☐Laboratory work ☐ Project work ☐ Seminar ☐Distance learning ☐ Blended learning ⊠ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| The course aims to apply the student's existing knowledge of basic mechanics and modelling and simulation of dynamical systems to road vehicles, in particular, vehicle subsystems, vehicle ride and handling behaviour. The key of the course material is the understanding of various dynamical equations of motion governing vehicle behaviour as well as computer simulation. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Introduction to the basic mathematical and mechanics concepts relevant for analyzing vehicle dynamics. Modelling and simulation of vehicle subsystems: tire; steering; suspension; gearbox; engine. Modelling and simulation of vehicle ride: vehicle/driver motions; vehicle vibration (frequency, dumping); suspension behavior of quarter car model, design and practical issues (springs, dumpers); road surface inputs and human response. Modelling and simulation of vehicle handling: understeer and oversteer; modelling and simulation of tires, their force and moment behavior. Modelling and simulation of ABS, ESP. Graphical methods of vehicle modeling. Case studies of modelling and simulation of vehicle ride and handling. |
| **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** | **20** |
| **Exercises** | **20** | **Oral examination** | **20** |
| **Teaching colloquia** | **30** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |