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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 | Control Systems in Vehicles |
| 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, Mitić B. Darko |
| Teaching mode |  ⊠ Lectures ⊠Group tutorials ☐ Individual tutorials ☐Laboratory work ☐ Project work ☐ Seminar ☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| The purpose of the course is to familiarise students with the control issues of the automotive subsystems that influence the general behaviour of the whole vehicle. The course will cover control system design and numerical simulation of automotive subsystems such as brake system, ride & handling systems (suspension, steering, ESP), and power-train (transmission, clutch, launch control, electronic differential). |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Introduction to vehicle control and basis of systems control engineering. Vehicle as a system, controlled by tyre forces and internal suspension loads, with interfaces to the driver and the traffic environment. Control of lateral dynamics. Control of longitudinal dynamics. Control of vertical dynamics. Applications of dynamics control systems. Assistance systems in commercial vehicles. Development of control systems for automotive applications. Power steering (EPS, EHPS). Integrated vehicle (body) control. Suspension control. Introduction to traction and brake control (ESP, ESC, DSC, ABS). Development of mathematical models in continuous- and discrete-time domain. Advanced control algorithms (fuzzy, neural network, sliding mode) designed and applied in automotive applications. |
| **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** |
| **Practical teaching** | **0** | **Oral examination** | **20** |
| **Exercises** | **20** | **Project** | **10** |
| **Teaching colloquia** | **20** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |