

Specification for the book of courses

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| Study program | | Electrical Engineering and Computer Science | | |
| Module | | Control Systems | | |
| Type and level of studies | | Undergraduate Academic Studies | | |
| The name of the course | | Control Systems in Automotive Industry | | |
| Lecturer (for lectures) | | Antić S. Dragan, Perić Lj. Staniša | | |
| Lecturer/associate (for exercises) | | Sibinović D. Vladimir | | |
| Lecturer/associate (for OFE) | | Sibinović D. Vladimir | | |
| Number of ECTS | 5 | Course status (obligatory/elective) | Elective | |
| Prerequisites | | | | |
| Course objectives | | | | |
| The aim 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, and power-train. The course concludes with students experimental researches on laboratory equipment. | | | | |
| Course outcomes | | | | |
| Upon completion of this course students will be able to formulate and solve control engineering tasks related to the most representative automotive systems using the control theory methodology. | | | | |
| Course outline | | | | |
| Theoretical teaching | | | | |
| Introduction to vehicle control and basis of systems control engineering. Applications of dynamical 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). Advanced control algorithms designed and applied in automotive applications. | | | | |
| Practical teaching (exercises, OFE, study and research) | | | | |
| Linear Vehicle Model. Nonlinear Vehicle Model. Design of model for ABS, ESP. Design of advanced control methods for automotive control systems. Simulation in Matlab and Simulink packages. Real-time experiments. | | | | |
| Textbooks/references | | | | |
| 1 | Uwe Kiencke, Lars Nielsen, "Automotive Control Systems: For Engine, Driveline, and Vehicle", Springer Verlag, 2005. | | | |
| 2 | Reza N. Jazar, "Vehicle Dynamics: Theory and Application", Springer Verlag, 2008. | | | |
| 3 | A. Galip Ulsoy, Huei Peng, Melih Çakmakci, "Automotive Control Systems", Cambridge University Press, 2012. | | | |
| 4 | | | | |
| 5 | | | | |
| Number of classes of active education per week during semester/trimester/year | | | | |
| Lectures | Exercises | OFE | Study and research work | Other classes |
| 2 | 2 | 1 | 0 | 0 |
| Teaching methods | | | | |
| Lectures; Auditory Exercises; Laboratory Exercises; Consultations | | | | |
| Grade (maximum number of points 100) | | | | |
| Pre-exam duties | | Points | Final exam | Points |
| Activity during lectures | | 10 | Written exam | 20 |
| Exercises | | 20 | Oral exam | 20 |
| Colloquia | | | | |
| Projects | | 30 | | |