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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) | Automatic Control; Computer Control Systems and Measurement Techniques |
| Course title | Methods of Digital Control and Estimation |
| Level of study | [ ] Bachelor [x]  Master’s [ ]  Doctoral |
| Type of course | [ ]  Obligatory [x]  Elective |
| Semester  |  [ ]  Autumn [x] Spring |
| Year of study  | I |
| Number of ECTS allocated | 4 |
| Name of lecturer/lecturers | Boban Veselić |
| Teaching mode |  [x] Lectures [ ] Group tutorials [ ]  Individual tutorials [ ] Laboratory work [x]  Project work [ ]  Seminar [ ] Distance learning [ ]  Blended learning [ ]  Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| *Introduce to students some modern approaches to digital control and control plant state estimation. Provide the students with theoretical and practical knowledge needed for the application of modern digital control techniques. Train the students to use computer support in design and simulation of digital control systems.* |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| **Review of the mathematical background and digital systems analysis in z-domain. Linear digital systems frequency response. Bilinear transformation. Bode plots. Digital compensators design in z- and frequency domain. State space approach. Controllability and observability. Canonical state space forms. State feedback control and pole placement method. Ackerman formula. Deadbeat response. State variables estimation. Linear digital state observers and their design. Elements of the theory of stochastic processes. State estimation in uncertain control systems. Kalman filter.** |
| **LANGUAGE OF INSTRUCTION** |
| [ ] Serbian (complete course) [ ]  English (complete course) [ ]  Other \_\_\_\_\_\_\_\_\_\_\_\_\_ (complete course)[x] 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** | **20** |
| **Practical teaching** | **20** | **Oral examination** | **20** |
| **Teaching colloquia** | **20** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |