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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Electronic Engineering |
| **GENERAL INFORMATION** |
| Study program  | Electrical Engineering and Computing |
| Study Module (if applicable) | Control Systems, Electrical Power Engineering |
| Course title | Automatic Control Systems |
| Level of study | ⊠ Bachelor ☐ Master’s ☐ Doctoral |
| Type of course | ⊠ Obligatory ⊠ Elective |
| Semester  | ⊠ Autumn ☐ Spring |
| Year of study  | Third, Fourth |
| Number of ECTS allocated | 6 |
| 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)** |
| Acquiring knowledge of nonlinear, discrete-time, and optimal control systems and their implementation in professional course subjects, as well as in practice. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Historical overview of automatic control systems (ACS). Nonlinear control systems. Discrete-time control systems. The structure of digital system and process of discretization. Discrete-time transfer functions. Stability of discrete-time ACS. Synthesis of discrete-time ACS. Examples of non-linear control systems. Typical nonlinearities and their characteristics. Linearization of nonlinear systems. System analysis in the phase plane. Stability of nonlinear ACS. Optimal control systems. Criteria functions. Design of Kalman regulator. Kalman regulator with pre-defined degree of exponential stability. Poles placement of multivariable systems by state feedback. Design of observer. Simulation of ACS. Implementation of simulation in analysis and synthesis of ACS. Simulation software for ACS. |
| **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** | **0** |
| **Teaching colloquia** | **30** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |