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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty** | Faculty of Mechanical Engineering |
| **GENERAL INFORMATION** |
| Study program  | **Mechatronics and Control** |
| Study Module (if applicable) | - |
| Course title | Advanced control systems  |
| Level of study | ☐Bachelor ☒ Master’s ☐ Doctoral |
| Type of course | ☐ Obligatory☒ Elective |
| Semester  | ☐ Autumn ☒Spring |
| Year of study  | I |
| Number of ECTS allocated | 6 |
| Name of lecturer/lecturers | Vlastimir D. Nikolić |
| Teaching mode | ☒Lectures ☐Group tutorials ☐ Individual tutorials☒Laboratory work ☒ Project work ☒ Seminar☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| *Introduce students to the basics of the analysis and design of the complex contemporary control systems, especially nonlinear and optimal control systems.**The course is targeting the solving problems in the domain of the development of the complex control systems.* |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| *1) Nonlinear automatic control systems. 2) Methods for analysis of nonlinear automatic control systems. 3) Lyapunov methods. 4)* *Popov's frequency method. 5) Harmonic linearization. 6)* A *natural nonlinearity systems, deliberately introduced nonlinearity systems (relay systems; variable structure systems). 7) Optimal control systems. 8) Method of dynamic programming. 9)* *Continuous linear square optimal regulators. 10)* *Projecting of the observer.* |
| **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** | **25** |
| **Practical teaching** | **10** | **Oral examination** | **25** |
| **Teaching colloquia** | **30** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |