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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 |
| Course title | Manipulators control |
| Level of study | [ ] Bachelor [ ]  Master’s [x]  Doctoral |
| Type of course | [ ]  Obligatory [x]  Elective |
| Semester  |  [x]  Autumn [ ] Spring |
| Year of study  | 2 |
| Number of ECTS allocated | 10 |
| Name of lecturer/lecturers | Đorđević S. Goran |
| Teaching mode |  [x] Lectures [ ] Group tutorials [ ]  Individual tutorials [ ] Laboratory work [x]  Project work [x]  Seminar [ ] Distance learning [ ]  Blended learning [ ]  Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| Coupled dynamic system control based on model dynamics and actuators models. Practical problems in industrial robot control. A hierarchical control approach to robotics. Models of actuators and sensors. Linear control laws in positioning and tracking. The problem of trajectory tracking. Centralized control. Centralized disturbance rejection. Impedance control. Controllers with open architecture. Programming a robot in a visual environment. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Control problems in robotics. The hierarchy of control laws in robotics. The basic level of control in robotics. Modeling of robot mechanism. Models of actuators and sensors. Decoupled control. Linear control laws. Calculated torque control. The problem of trajectory tracking. Centralized control. Centralized disturbance rejection. Robust control. Impedance control. Adaptive control. Intelligent controller based on the model of interaction. Controllers with open architecture. Robot controllers specifics. Robot programming. The integration of robots in manufacturing. |
| **LANGUAGE OF INSTRUCTION** |
| [x] Serbian (complete course) [x]  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** | **0** | **Written examination** | **0** |
| **Practical teaching** | **50** | **Oral examination** | **50** |
| **Teaching colloquia** | **0** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |