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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 | Introduction to Robotics |
| Level of study | [x] Bachelor [ ]  Master’s [ ]  Doctoral |
| Type of course | [x]  Obligatory [ ]  Elective |
| Semester  |  [ ]  Autumn [x] Spring |
| Year of study  | 4 |
| Number of ECTS allocated | 5 |
| Name of lecturer/lecturers | Đorđević S. Goran |
| Teaching mode |  [x] Lectures [ ] Group tutorials [ ]  Individual tutorials [ ] Laboratory work [ ]  Project work [ ]  Seminar [ ] Distance learning [ ]  Blended learning [ ]  Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| Introduction to the basic issues of modern industrial robotics and applications of industrial robots. The concept of robotics and problems. Mathematical foundations of robotics. The main components of robot. The organization of robot as a system. Robot control. Programming and application of robots. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| The geometry of robot. Kinematic model of robot. Differential kinematics. Robot drive systems. Electric, hydraulic and pneumatic drive. Systems for transmission of driving torque. Robot dynamics. Model of the robot dynamics. Analysis of modeled and non-modeled effects. Simulation of the robot. Trajectory planning. Synthesis of trajectories in the internal and external coordinates. Sensors in robotics. Executive bodies of the robot. Control in the internal coordinates. Control in the external coordinates. Inverse kinematic and dynamic control. Position and power control. Intelligent management. Planning activities. Functional architecture of the control system. The application of robots. The introduction of robots in manufacturing. Service robots. Automatic guided vehicles. Robots in service, medical and cosmic applications. |
| **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** | **20** | **Written examination** | **20** |
| **Practical teaching** | **20** | **Oral examination** | **30** |
| **Teaching colloquia** | **20** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |