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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 | Robotics |
| Level of Study | ☐Bachelor | ☒ Master’s | ☐ Doctoral |
| Type of Course | ☒ Obligatory | ☐ Elective |
| Semester | ☒ Autumn | ☐ Spring |
| Year of Study | I |
| Number of ECTS Allocated | 7 |
| Name of Lecturer/Lecturers | Žarko Ćojbašić |
| 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 theoretical basics of robotics, robot types, principles of contemporary industrial robotics, basics of kinematics, dynamics and control of industrial robots, as well as basic components and applications of robotic systems. To provide that systems are capable to design, select control and apply robotic systems and especially industrial robots, as well as to use different models and to be prepared for further education in the field of robotics.* |
| **Syllabus (brief outline and summary of topics, max. 10 sentences)** |
| **Theoretical lectures \*** Basic robot types. Industrial and service robotics. \* Kinematics. Link between end effector coordinates and joint positions. Direct and inverse kinematics. Task of moving end effector along desired trajectory. \* Robot dynamics, dynamic models. Selection of robot parameters. Test of dynamic characteristics. \* Control of one robot joint, servosystem synthesis. Effect of moments of inertia. Effect of gravitational moments and friction. \* Synthesis of servosystem for trajectory tracking. Control of simultaneous movement of several joints. \* Dynamic robot control. Robot dynamics in contact tasks. \* Sensors and actuators in robotics and especially in industrial robotics. Applications of industrial robots. **Practical work \*** Computational exercises. Individual work – forming of models of robot with 3 DOF for existing configurations of industrial robots. Laboratory programming of industrial robots.  |
| **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** | **40** | **Oral Examination** | **25** |
| **Teaching Colloquia** | **0** | **Overall Sum** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |