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| **UNIVERSITY OF NIŠ** | | | | | | | | |
| **Course Unit Descriptor** | | | **Faculty** | | Faculty of Mechanical Engineering | | | |
| **GENERAL INFORMATION** | | | | | | | | |
| Study Program | **Mechanical Engineering** | | | | | | | |
| Study Module (if applicable) | - | | | | | | | |
| Course Title | Computer Aided Analysis and Design of Control Systems | | | | | | | |
| Level of Study | ☒Bachelor | | | ☐ Master’s | | | | ☐ Doctoral |
| Type of Course | ☐ Obligatory | | | ☒ Elective | | | | |
| Semester | ☒ Autumn | | | ☐ Spring | | | | |
| Year of Study | III | | | | | | | |
| Number of ECTS Allocated | 6 | | | | | | | |
| 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 basics of digital systems and signals, basics of computer technology, software support for analysis and design of control systems as well as with application of control computers in industry and technical systems. Provide students with knowledge about structure, principles of analysis and synthesis of digital systems, computer hardware and its application in control systems, as well as application of computers for analysis and design of control systems and at different levels of production automatization (CAD, CAM, CAE, and other concepts) and building of complex distributed computer systems (SCADA and DCS systems).* | | | | | | | | |
| **Syllabus (brief outline and summary of topics, max. 10 sentences)** | | | | | | | | |
| **Theoretical lectures \*** Computer aided analysis and design of control systems. Specialized software packages. Development of control systems by “rapid prototyping” techniques. \* Matlab and its toolboxes for control systems analysis and design. \* Basics of LabView package and its application in analysis, design and implementation of control systems. \* Problems of control of complex technological processes. Role of computers in process control. \* Centralized control. Distributed control. Hierarchical control. \* Choice of computers for real time control. Input output devices. Software support for real time control. Coupling of computers with technological processes. \* Application of PLC controllers in process control. Application of computes in process industry, in modern CNC systems and in control of communal systems. Control systems based on PC hardware. Industrial PCs. Architectures of programmable industrial controllers and PLCs. Software support for PLC and PAC controllers based control.  **Practice \*** Computer aided analysis and design of control systems. \* Individual development of simple control systems by application rapid control prototyping. | | | | | | | | |
| **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** | | | | | | | | |