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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Pedagogy |
| **GENERAL INFORMATION** |
| Study program  | Technical Education and Informatics  |
| Study Module (if applicable) |  |
| Course title | Automatic control systems |
| Level of study | ☐Bachelor ☐ Master’s ☐ Doctoral |
| Type of course | ☐ Obligatory ☐ Elective |
| Semester  |  ☐ Autumn ☐ Spring |
| Year of study  | 4 |
| Number of ECTS allocated | 6 |
| Name of lecturer/lecturers | Vlastimir D. Nikolić |
| Teaching mode |  ☐Lectures ☐Group tutorials ☐ Individual tutorials ☐Laboratory work ☐ Project work x☐ Seminar ☐Distance learning ☐ Blended learning ☐ Other |
| **PU RPOSE AND OVERVIEW (max. 5 sentences)** |
| The contents of this course enable students to become familiar with models of the control objects as well as basic of the analysis and designing of control of the classes of the technical objects as well as practical insight into the basic control equipment. Introduce students to different techniques of the analysis and designing of contemporary continuous and digital control systems for various classes of technical objects. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| • Introductory content- development, significance, classification and application of automatic control systems. Methods for representation of control systems.• Modeling and simulation of various classes of the basic mechanical objects. Modeling of the mechanical objects and processes.• Representation of the continuous systems by transfer functions and the state space models.• The analysis of the continuous control systems. The frequency and time domain analysis of systems. The response and accuracy of the systems in steady state.• Stability of continuous control systems.• Designing of control systems. Classical methods of automatic control systems and state space model designing.• Digital control systems, structure and components.• Elements of discrete signal theory. The process of sampling and reconstruction of signals. Transformational methods in analysis of the discrete systems.• Discrete transfer function. Conception of the state space in modeling of the discrete automatic control systems. Stability of the discrete automatic control systems.• Application of computer techniques in control of mechanical systems. Control computer systems for working in real time. Applications of computers and microcontrollers.• Applications of the programmable logic controllers (PLC).• The use of computers for complex automation of mechanical systems. Supervisory control and data acquisition systems (SCADA). |
| **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** |