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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Electronic Engineering |
| **GENERAL INFORMATION** |
| Study program  | Electronics and Microsystems |
| Study Module (if applicable) | Electronics |
| Course title | Simulation and optimization of electronic circuits |
| Level of study | [ ] Bachelor [x]  Master’s [ ]  Doctoral |
| Type of course | [ ]  Obligatory [x]  Elective |
| Semester  |  [ ]  Autumn [x] Spring |
| Year of study  | 1 |
| Number of ECTS allocated | 5 |
| Name of lecturer/lecturers | Petković M. Predrag, Milić Lj. Miljana |
| Teaching mode |  [x] Lectures [ ] Group tutorials [ ]  Individual tutorials [x] Laboratory work [x]  Project work [ ]  Seminar [ ] Distance learning [ ]  Blended learning [ ]  Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| Objective is adoption and systematization of knowledge about algorithms for analysis and optimization of analog circuits, and simulation of digital and mixed-signal circuits. Acquisition the competencies for analysis and optimization of analog circuits to the extent that qualify students to develop their own programs for the simulation of analog, digital and mixed-signal circuits. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Simulation of analog circuits: Domains of abstraction: DC, AC, time-domain. Algorithms for the simulation. Simulation of linear resistive circuits Simulation of nonlinear resistive circuit. Simulation of reactive linear circuits. Simulation of nonlinear reactive circuits. Characteristics of simulations in different domains. Basic models of passive and active components of electronic circuits. Simulation of digital circuits (the principles of path selection and succeeding event). Discrete event simulation. Simulation of mixed-signal circuits. Methods for estimating power and delay. Optimization of electronic circuits. The importance of weight functions. Algorithms for optimization. Simulated annealing. Evolutionary algorithms. Constrained optimization. Deterministic and statistical tolerance analysis. |
| **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** | **10** | **Written examination** |  |
| **Practical teaching** | **60** | **Oral examination** | **30** |
| **Teaching colloquia** |  | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |