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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) | Electronics |
| Course title | Synthesis of filters |
| Level of study | [ ] Bachelor [ ]  Master’s [x]  Doctoral |
| Type of course | [ ]  Obligatory [x]  Elective |
| Semester  |  [ ]  Autumn [ ] Spring |
| Year of study  | 2 |
| Number of ECTS allocated | 10 |
| Name of lecturer/lecturers | Goran Stancic, Vlastimir Pavlovic |
| Teaching mode |  [x] Lectures [ ] Group tutorials [x]  Individual tutorials [ ] Laboratory work [x]  Project work [ ]  Seminar [ ] Distance learning [ ]  Blended learning [ ]  Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| The expansion and upgrade of the basic knowledge acquired in the field of analog and digital signals processing and method of filter transfer function approximation with goal to adopt new techniques which require specific approximations and specific implementations. At the same time optimal filter implementation are analyzed. Analysis of the impact of the finite word length. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Transfer function. Characteristic function. Synthesis of passive filters. Synthesis of polynomial filters. Synthesis of filters with finite transmission zeros. Minimum phase filters. Synthesis of active RC filters. Filter configurations. Impedance converters. Realization of biquad transfer function. Active RC network with distributed parameters in the integrated technology. Digital filters. Transfer function of the digital filter. Bilinear z transform. The basic filter configurations. Recursive and nonrecursive digital filters. Direct methods of approximation in the z-domain. IIR and FIR filter function. Filter realization. Properties of different configurations. Sensitivity. |
| **LANGUAGE OF INSTRUCTION** |
| [x] Serbian (complete course) [ ]  English (complete course) [ ]  Other \_\_\_\_\_\_\_\_\_\_\_\_\_ (complete course)[x] Serbian with English mentoring [ ] Serbian with other mentoring \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **ASSESSMENT METHODS AND CRITERIA** |
| **Pre exam duties** | **Points** | **Final exam** | **points** |
| **Activity during lectures** |  | **Written examination** |  |
| **Practical teaching** | **50** | **Oral examination** | **50** |
| **Teaching colloquia** |  | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |