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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Electronic Engineering, Niš |
| **GENERAL INFORMATION** |
| Study program  | Electrical Engineering and Computing |
| Study Module (if applicable) | Electronics |
| Course title | Architectures and Algorithms |
| Level of study | ☐Bachelor ☐ Master’s ☐ Doctoral |
| Type of course | ☐ Obligatory ☐ Elective |
| Semester  | ☐ Autumn ☐ Spring |
| Year of study  | II |
| Number of ECTS allocated | 6 |
| Name of lecturer/lecturers | Đorđević Lj. Goran |
| Teaching mode |  ☐Lectures ☐Group tutorials ☐ Individual tutorials ☐Laboratory work ☐ Project work ☐ Seminar ☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| The course objective is to teach students with: a) fundamental concepts of embedded systems programming, and b) basic techniques for design and analysis of efficient algorithms emphasizing methods useful in practice.At the completion of this course, students will be able to understand: a) the basic principles and concepts behind embedded systems, and obtain hands-on experience in programming embedded systems; b) the basic techniques for design and analysis of algorithms, and c) a number of important basic algorithms and their properties. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Introduction to embedded systems: main application areas and examples, common characteristics, and challenges in embedded systems design. Basic building blocks of embedded systems. Review C/C++ language with embedded perspective. Basic programming of digital I/O, analog I/O, interrupts, and communication. Algorithm design and analysis. Complexity of algorithms. Sorting: heapsort, quicksort, mergesort. Elementary data structures: stacks and queues, linked lists; hash tables. Recursive algorithms. Trees: binary search trees, binary heap. Graph algorithms: representation of graphs, traversal; minimal spanning tree, single-source and all-pairs shortest path. |
| **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** | **30** |
| **Practical teaching** | **10** | **Oral examination** | **20** |
| **Teaching colloquia** | **30** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |