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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty** | **Electronic Engineering** |
| **GENERAL INFORMATION** |
| Study program  | Electrical Enginering and Computing |
| Study Module (if applicable) | Computing and Informatics |
| Course title | Data Structures |
| Level of study | ☒Bachelor ☐ Master’s ☐ Doctoral |
| Type of course | ☒ Obligatory☐ Elective |
| Semester  | ☐ Autumn ☒Spring |
| Year of study  | 2 |
| Number of ECTS allocated | 6 |
| Name of lecturer/lecturers | Leonid Stoimenov |
| Teaching mode | ☒Lectures ☐Group tutorials ☐ Individual tutorials☒Laboratory work ☐ Project work ☐ Seminar☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| *Course objective: Obtaining knowledge on basic concepts of fundamental data structures, as well as the knowledge needed for designing, implementing and using data structures.**Course outcomes: Theoretical and practical knowledge on concepts, internal design and implementation of fundamental data structures in programming languages C/C++ and Java.* |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| 1. Introduction: Definition and overview of data structures; data structures in software engineering; 2. Arrays: array definition, array operations, string data types3. Linked lists: structure definition, linked lists' types - single linked, double linked, cyclical; operations (traversal, addition, deletion), static and dynamical linked lists' implementation4. Queue, Stack, Dequeue: structure definition, static and dynamical implementation of queue, stack and dequeue, basic operations (traversal, addition, deletion) 5. Hash tables: structure definition, term definitions (hash function, collision, synonyms), collision resolution (open addressing, linking synonyms), hash table implementation, basic operations 6. Trees: basic terms, general and binary trees, basic operations (traversal, addition, deletion), ordered binary trees, static and dynamical implementation, Heap, search trees, B, B\*, B++ trees.7. Graphs: term definitions, static (adjacency matrix and incidence matrix) and dynamical graph representation (linked structures), operations for static and dynamical implementation, graph traversals: depth-first search and breadth-first search, shortest path in graph 8. Datafiles: sequential, index-sequential, index-un-sequential, multiple keys datafiles.  |
| **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** |  | **Written examination** | 40 |
| **Practical teaching** | 20 | **Oral examination** |  |
| **Teaching colloquia** | 40 | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |