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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 types  3. Linked lists: structure definition, linked lists' types - single linked, double linked, cyclical; operations (traversal, addition, deletion), static and dynamical linked lists' implementation  4. 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** | | | | | | |