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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) | | | | Control Systems | | |
| Course title | | | | Databases | | |
| Level of study | | | | ☒Bachelor ☐ Master’s ☐ Doctoral | | |
| Type of course | | | | Obligatory ☒ Elective | | |
| Semester | | | | ☐ Autumn ☒Spring | | |
| Year of study | | | | 3 | | |
| 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: Gaining fundamental knowledge necessary to design, implement and use databases.*  *Course outcomes: Theoretical and practical knowledge of database design and data models (ER, EER, UML), relational data model and database implementation, and relational algebra.* | | | | | | |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** | | | | | | |
| 1. Introduction to databases: basic concepts (data, information, database, database management system, database system, and database applications), conventional processing and processing based on databases.  2. Data models: levels of abstraction in DBMSs, the concept of data model and its components, conceptual design of databases, (E)ER data model, designing databases.  3. Relational model: concepts of the relational model, structural and integrity component, relational scheme, relation, relation key, constraint specification and SQL DDL commands.  4. Relational algebra: relational algebra, relational algebra operations, relational algebra queries, examples of queries.  5. Functional dependencies: definition of a functional dependency, rules of derivation for functional dependencies, closure of a set of functional dependencies.  6. Relation schema analysis: analysis process and the quality of the designed database, anomalies in poorly designed databases, relation decomposition in normalization and properties.  7. Normalization: the purpose of normalization and normal forms, normal forms definitions and testing (first, second, third and Boyce-Codd's normal form), normalization process.  8, Introduction to transactional processing: the concept of transaction, ACID properties of transactions, DBMS level transactions.  9. Database system architecture, overview: monolithic systems, multiuser systems, client-server systems, two- and three-layer architectures, parallel/distributed server database, data fragmentation. | | | | | | |
| **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** | 5 | | **Written examination** | | | 40 |
| **Practical teaching** | 15 | | **Oral examination** | | |  |
| **Teaching colloquia** | 40 | | **OVERALL SUM** | | | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** | | | | | | |