Study program: Information Technology

Course title: DATABASE PROGRAMMING

Teacher(s): Danijela G. Milošević

Course status: elective

Number of ECTS credits: 6

Prerequisite courses: none

Course objectives

Students will become more familiar with current database management systems. Familiarity with advanced commands and functions of SQL (Structured Query Language) language, as well as working with the PL/SQL language provides knowledge about programming, optimization, maintenance and administration of databases. This completes the knowledge of programmers or administrators to map a concrete real system into an application.

Learning outcomes

After successful completion of this course, students will have theoretical and practical knowledge in the implementation of databases by creating real database systems with advanced concepts of SQL and PL/SQL.

Content of the course

Theoretical teaching

Relational database management systems. The environment for working with ORACLE databases. Advanced SQL features: improving query performance; advanced use of functions. Denormalization. Basics of database security. Database and user administration. Transactions. Concurrency. Recovery. Optimization. PL/SQL concepts that enable application logic to be saved in the database itself. Structure and types of blocks, declaration of variables. Working with cursors. Managing errors. Procedures. Functions. Triggers. NoSQL databases.

Practical teaching

Computer laboratory exercises follow lectures and introduce students to ORACLE database programming. During exercises, students work with various Oracle environments for working with databases: Oracle Application Express, SQL Developer. Hands-on work with MongoDB and Apache Cassandra.

Literature

[1] Joan Casteel, Oracle 12c: SQL 3rd Edition, Cengage Learning, 2015, ISBN 978-1305251038

[2] Snežana R. Popović, Miloš Milosavljević, SQL programiranje, Računarski fakultet, Beograd, 2020, ISBN: 978-86-7991-432-3

[3] М. Веиновић и други, Базе података, Универзитет Сингидунум, Београд, 2018, ISBN: 978-8679126849

[4] Benjamin Rosenzweig, Elena Rakhimov, Oracle PL/SQL by Example 6th Edition, Oracle Press; 2023, ISBN: 978-0138062835

[5] C. Coronel, S. Morris, Database Systems: Design, Implementation, & Management 13th Edition, Cengage Learning, 2018, ISBN: 978-1337627900

[6] Andreas Meier, Michael Kaufmann, SQL & NoSQL Databases: Models, Languages, Consistency Options and Architectures for Big Data Management, Springer Vieweg, 2019, ISBN: 978-3658245481

Number of active teaching classes: 4	**Theoretical teaching: 2**	**Practical teaching: 2**

Teaching methods

A combination of classical teaching with the use of an electronic course and specified literature is applied. Homework using the above tools is also required.

Evaluation of knowledge (maximum number of points 100)

Pre-exam obligations	**Points**	**Final exam**	**Points**
Activities during teaching process	10	Final exam (written):	/
Practical teaching	/	Final exam (oral):	30
Colloquium	60		