Course Unit Descriptor

Study Programme: Computer Science	
Course Unit Title: Databases 2	
Course Unit Code: CS614	
Name of Lecturer(s): Jovana Vidaković	
Type and Level of Studies: Bachelor Academic Degree	
Course Status (compulsory/elective): Elective	
Semester (winter/summer): Summer	
Language of instruction: Serbian (primary), English (secondary)	
Mode of course unit delivery (face-to-face/distance learning): Face-to-face	
Number of ECTS Allocated: 6	
Prerequisites: Databases 1, Object-oriented programming 1	

Course Aims:

Introducing principles of development of client-server applications that use database. Understanding of methodologies for connecting applications that use database and principles that functioning of classical and distributed DBMSs are based on.

Learning Outcomes:

Minimum:

After successful completion of this course students are able to create application which communicates with a database.

Desirable:

After successful completion of this course students are able to understand principles of the JDBC interface and ORM specification for an application which communicate with a database. Students are also able to deeply understand principles of classic and distributed DBMSs.

Syllabus:

Theory

Client-server architecture. Multilayer architecture. Principles of binding applications and databases. Object-relational mapping (ORM). Normalization of relational datamodel. Physical organization of databases. Transaction management in DBMSs. Distributed DBMSs. Security of databases.

Practice

In practical part of this course students create two-layer application that uses JDBC to communicate with relational database.

Required Reading:

Recommended

1.   Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom, Database Systems, The Complete Book, Prentice Hall, Pearsons Education International, 2002.

2.   C.J. Date, An Introduction to Database Systems, Pearson, Addison Wesley, 2004.

3.   Mike Keith, Merrick Schincariol, Pro JPA 2 (Expert's voice in Java), Apress; 2nd edition, 2013.

Weekly Contact Hours: 5	**Lectures:** 2	**Exercises:** 1	**Practical work:** 2

Teaching Methods:

Classical teaching methods using projector are applied during theoretical instruction. Principles of creating applications

that use database are described. The object-relational mapping is introduced, too. Classical teaching methods are used on excercises where relational data model normalization examples are described, as well as principles of creating and maintaining physical data structures (B trees).

Practical instruction is performed in computer laboratory where students are introduced with development tools through practical work. Through practical examples and labs, they illustrate a small application that communicate with a database using JDBC driver. After that, student learn to apply ORM and create two-layer application with CRUD functionalities. On the final exam student has to perform knowlegde of relational data model normalization, principles of physical data structures, as well as functioning of classical and distributed DBMSs.

Knowledge Assessment (maximum of 100 points): 100

Pre-exam obligations	points	Final exam	points
Active class participation		written exam	
Practical work/Project	30	oral exam	40
Preliminary exam(s)		…….	
Seminar(s)			
Test (theory)	20		
Practical test	10		

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.