

**Faculty of Science and Mathematics / COMPUTING AND INFORMATION TECHNOLOGY /
REALIZATION OF DATABASE**

Course:	REALIZATION OF DATABASE			
Course ID	Course status	Semester	ECTS credits	Lessons (Lessons+Exercises+Laboratory)
6940	Mandatory	1	4	3+0+0
Programs	COMPUTING AND INFORMATION TECHNOLOGY			
Prerequisites	INTRODUCTION TO COMPUTER SCIENCE, COMPUTERS AND PROGRAMMING, OPERATING SYSTEMS			
Aims	Through this course students learn the basic concepts of databases, their internal structure, methods of implementation, the principles and criteria of the design. In addition, students are introduced to some of the major modern DBMS, with special emphasis on query language SQL, administration and database programming.			
Learning outcomes	Once the student passes the exam, will be able to: 1. understand the basic concepts and theoretical basis of databases; 2. design databases using the ER model and translate them into relational model; 3. know theoretical basis and to use manipulative formalisms of relational language, query languages; 4. implement databases in modern database management systems; 5. understand in advanced level and to write queries in SQL query language.			
Lecturer / Teaching assistant	prof.dr. Predrag Stanišić, doc.dr Aleksandar Popović			
Methodology	Lectures, exercises in computer classroom/laboratory. Learning and practical exercises. Consultations.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Introduction. Database. Database management system. Disadvantages of the classical approach based on file system.			
I week exercises	Introduction. Working with Microsoft.Net development tools.			
II week lectures	Levels of data abstraction. The instance and schema. Data models. Query language. DDL, DML, DGPS, DCL, ... Users of the system. Main tasks and components of a DBMS. General structure of DBMS.			
II week exercises	Introduction to the principles of OOP. The first homework assignment.			
III week lectures	E / R model. Basic concepts. Entity, a collection of entities, attributes, relationships, types of connections. The diagrams.			
III week exercises	Syntax of vb.net			
IV week lectures	E / R model. Strong and weak Entities. Extended E / R model. Specialization, generalization, aggregation.			
IV week exercises	Basic visual controls: textbox, button, label, checkbox, optionbox, DropDownList, PictureBox, mainmenu ...			
V week lectures	E / R model. Examples.			
V week exercises	E / R model. Examples. Second homework.			
VI week lectures	The relational model. Structural part of the relational model. Domain, attribute, relation. Integrity part of the model. Primary and foreign key, general constraints.			
VI week exercises	Introduction to commercial and non-commercial database management systems: Oracle, SQL Server, Access, etc. Advantages, disadvantages, differences.			
VII week lectures	Translation of E / R model into relational. SQL DDL.			
VII week exercises	SQL DDL Third homework			
VIII week lectures	COLLOQUIUM			
VIII week exercises	COLLOQUIUM			
IX week lectures	Relational manipulative formalisms. The relational algebra.			
IX week exercises	Relational manipulative formalisms. The relational algebra. Fourth homework			
X week lectures	Extended relational algebra. Examples.			
X week exercises	Examples.			
XI week lectures	Relational calculus of tuples and domains. Equivalence of relational manipulative formalisms.			

XI week exercises	Relational calculus of tuples and domains. Equivalence of relational manipulative formalisms.					
XII week lectures	SQL DML. Requests of a relation.					
XII week exercises	SQL					
XIII week lectures	SQL DML. Grouping and soak up over several issues, mergers.					
XIII week exercises	SQL					
XIV week lectures	SQL DML. Subqueries. Fifth homework					
XIV week exercises	SQL					
XV week lectures	Project presentation					
XV week exercises	COLLOQUIUM					
Student workload	Work Hours: 8 credits x 40/30 = 10 hours and 40 minutes Work hours structure: 3 hours for teaching 3 hour for exercises 4 hours and 40 minutes for individual work, including consultations and Teaching final exam: 10 hours and 40 minutes x 16 = 170 hours and 40 minutes Preparation before the beginning of the semester (before semester): 2 x (10 hours and 40 minutes) = 21 hours and 20 minutes Total work hours for course 8x30 = 240 hours of additional work for exams preparing correction of final exam, including the exam taking 0-48 hours (the remaining time of the first two items to the total work hours for the subject of 240 hours) structure: 170 hours and 40 minutes (lectures) + 21 hours and 20 minutes (preparation) +48 hours (additional work)					
Per week			Per semester			
4 credits x 40/30=5 hours and 20 minuts 3 sat(a) theoretical classes 0 sat(a) practical classes 0 excercises 2 hour(s) i 20 minuts of independent work, including consultations			Classes and final exam: 5 hour(s) i 20 minuts x 16 =85 hour(s) i 20 minuts Necessary preparation before the beginning of the semester (administration, registration, certification): 5 hour(s) i 20 minuts x 2 =10 hour(s) i 40 minuts Total workload for the subject: 4 x 30=120 hour(s) Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) 24 hour(s) i 0 minuts Workload structure: 85 hour(s) i 20 minuts (cources), 10 hour(s) i 40 minuts (preparation), 24 hour(s) i 0 minuts (additional work)			
Student obligations			Students are required to attend classes, as well as doing home exercises, and work colloquium.			
Consultations			Cabinet			
Literature			Silberchatz, Korth: Database Systems Concepts, McGraw-Hill C.J. Date An Introduction to Database Systems, Addison-Wesley			
Examination methods			5 home exercises 10 points total (2 points for each), - Each test 25 points - The project 20 points. - Final exam 20 points. The passing grade is obtained with at least 50 points.			
Special remarks			Lectures are taught for group of about 40-60 students, exercises in groups of about 20 students. Lectures may be taught in English and Russian			
Comment						
Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points