

NAME OF THE COURSE		Databases				
Code	PMIH10	Year of study				
Course teacher	prof.dr. sc. Marko Rosić	Credits (ECTS)	5,0			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			30		30	
Status of the course		Percentage of application of e-learning				
COURSE DESCRIPTION						
Course objectives	Understanding the basic concepts of relational data model. The acquisition of knowledge and skills needed in the design of relatively simple databases based on the relational model. Acquiring knowledge of syntax and semantics of SQL language and understanding the SQL queries execution plan. Object oriented representation of the relational database.					
Course enrolment requirements and entry competences required for the course	Admission requirements: none. Entry competences: user level using the operating system, knowledge of object-oriented programming concepts, basic knowledge of C #.					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. define the basic concepts of relational database model 2. Establish relational model of relatively simple problems from the real world which are described in natural language 3. Introduce a relational database object 4th use SQL query language for searching and updating relational database 5th understand the plan of execution of SQL queries and indexes role in it 6th understand the basic concepts related to the administration and the security database					
Course content broken down in detail by weekly class schedule (syllabus)	<p>Week 1: Introduction to the subject. The information and data. The role of the database in the information system. Historical Development of databases: file, hierarchical, network, relational and object databases. Exercises: connect the client - the user interface editor SQL queries - with a system for relational database management MS SQL Server. Create a database using a graphical user interface. Data types.</p> <p>Tjedan2: The terms of the relational data model. Relational Algebra (Part 1): Operation Union, intersection, difference, projections and restrictions. Incomplete information and the NULL value. The properties of the relational query language SQL. Exercises: The syntax and semantics of SQL (Part 1): select-from-where. Frequently used functions in queries. Operations with NULL values.</p> <p>Week3: Relational Algebra (Part 2): theta and natural joining, aggregation functions. Exercises: The syntax and semantics of SQL (Part 2): inner join, left and right outer join, and full join. Workout queries over the prepared database.</p> <p>Week4: Views. DDL part of SQL. Codd's rules. The structure of a typical system for relational database management. Exercises: The syntax and semantics of SQL (Part 3): insert into, update from, delete from, create, alter and drop.</p> <p>Tjedan5:</p>					

	<p>The creation of the relational data model. The integrity and consistency of the database. Restrictions in order to preserve integrity.</p> <p>Exercises: nested SQL queries. SQL queries aggregation: group by - having.</p> <p>Workout queries.</p> <p>Tjedan6: Functional dependencies data. Normalization. Normal forms: 1NF, 2NF and 3NF.</p> <p>Exercises: Introduction to SQL execution plan instruction. Workout queries.</p> <p>Tjedan7: Normal forms: Boyce-Codd, 4NF4 and 5NF.</p> <p>Exercise: Preparing for the first midterm.</p> <p>Tjedan8: ER model (part 1): identification of entities and their attributes. The types of connections between the entities.</p> <p>Exercise: The first colloquium.</p> <p>Tjedan9: ER model (Part 2): decomposition connection M: N recursive relationship.</p> <p>Exercises: Design ER model (Part 1) Based on the analysis of the problem described in natural language.</p> <p>Tjedan10: Study example of creating an ER model.</p> <p>Exercises: Design ER model (part 2). Implementation of relational schemas.</p> <p>Tjedan11: Indices. Optimizing SQL queries. Materialized views.</p> <p>Exercises: practicing design ER model.</p> <p>Tjedan12: Transactions. Types of locking elements of a relational database. Triggers, stored procedures and functions.</p> <p>Exercise: Optimizing SQL queries.</p> <p>Tjedan13: Properties LINQ query language. Presentation of object-relational database.</p> <p>Exercises: tool LINQ to SQL Classes. Linking to the relational database management from the application program. LINQ queries in a simple console application.</p> <p>Tjedan14: The basic database administration. The management of user rights. Backing up and restoring.</p> <p>Exercise: Preparing for the second midterm.</p> <p>Tjedan15: The role of the log (Eng. Log) database. Database recovery after collapsing. The term replication. Distributed Databases.</p> <p>Exercise: The second colloquium.</p>
<p>Format of instruction</p>	
<p>Student responsibilities</p>	<p>Lecture attendance 70%, exercise attendance 70%, 3 homework, 2 tests, written and oral exam. Students who are successful at colloquia go to the oral exam.</p>

Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Name	Ects	Name	Ects	Name	Ects
	Class attendance	1	Research		Experimental work	
	Oral exam	2	Report		Homework assignments	
	Seminar essay		Essay			
	Tests		Practical training			
	Written exam	2	Project			
Grading and evaluating student work in class and at the final exam	<p>Activity of students in lectures and exercises (presence at lectures and exercises, addressing the challenges of homework) (20%).</p> <p>Written exam (40%): The semester are held two tests with the tasks of the SQL language, ie, design relational database. Each of them is scored on a scale of 0-50 points. Students who achieve at least 25 points in each colloquium released a written exam. Other students take a written examination, which substantially corresponds to the colloquia.</p> <p>Oral exam (40%) is compulsory for all students, while answering three questions randomly selected from a list of 50 questions divided into three categories.</p> <p>The final grade is derived on the basis of all these ratings with weighting factors as indicated in parentheses for each form of assessment.</p>					
Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
				0		
Optional literature (at the time of submission of study programme proposal)	Tonci Dadic: Databases - script: <a href="http://www.pmfst.unist.hr/~tdadic/Dadic_BazePodataka.pdf">http://www.pmfst.unist.hr/~tdadic/Dadic_BazePodataka.pdf</a>					
Quality assurance methods that ensure the acquisition of exit competences	Talk with students, student evaluation using the anonymous survey, the success of students in the exam, self-assessment.					
Other (as the proposer wishes to add)						