Course Name : Databases								
Course Code	Course Type	Regular Semester	Lecture (hours/we ek)	Seminar (hours/we ek)	Lab. (hours/we ek)	Credits	ECTS	
CMP 217	В	Fall	3.00	0.00	1.00	3.50	5.00	
	Lecturer	Kleona Elezi, Msc						
	Assistant	Hersi Kopani, Msc						
Course language		Albanian						
Course level Bachelor								
	Description	This course provides the necessary theoretical and practical foundations for relational database management systems. It also covers data analysis and modeling using entity-relationship techniques, relational theory and normalization, and the SQL language.					and	
	Understand the role of databases in managing and storing information. Distingu between a database, a database management system (DBMS), and a relational database. Understand data modeling and database design. Create entity-relationship (ER) diagrams and convert them into relational tables. Learn to use SQL for creating tables, inserting, and modifying data. Use SQL commands for querying, updating, deleting, and managing data (SELECT, INSERT, UPDATE, DELETE). Explore concepts of data normalization and denormalization to elimina redundancy and improve efficiency. Apply normalization forms up to the fourth normal form (4NF). Master methods for optimizing SQL query performance. Understand the use of indexes, query speed, and system resource management Learn about transactions and how to maintain data integrity. Understand the AC properties (Atomicity, Consistency, Isolation, Durability) and their implementation in DBMS. Study techniques for securing data and controlling access to database Learn methods for data backup and recovery. Understand user management an privilege control. Learn procedures for databases maintenance and performance optimization. Understand distributed databases and distributed databases management systems: Explore the concept of distributed databases and data synchronization across multiple systems. Examine the use of databases in mode applications, such as content management systems (CMS), e-commerce service etc.				elational ty- rn to use nds for DATE, o eliminate e fourth nce. lagement. nd the ACID ementation databases. ement and ormance se lid data is in modern			

Introduction to Databases Understanding Databases: Definition and importance of databases. Types of Databases: Relational, non-relational, distributed databases, etc. Definition and Characteristics of a DBMS (Database Management System). Data Modeling and Database Design ER Diagrams (Entity-Relationship): Creating and understanding relationships between entities. Data Modeling Concepts: Entities, attributes, relationships. Database Design: Creating tables from ER diagrams. SQL Language - Part 1 Creating and Manipulating Databases with SQL: Creating tables and inserting data. Basic commands: CREATE, INSERT. Simple SQL Queries: SELECT, filtering data with WHERE. SQL Language - Part 2 Modifying and Deleting Data: UPDATE, DELETE. Advanced Queries: Joins, grouping, and aggregate functions (COUNT, SUM, AVG). Limiting Results: ORDER BY, LIMIT, GROUP BY. Data Normalization Normalization Concept: Reducing redundancy and improving efficiency. Normalization Forms: First, second, third, and fourth normal forms (1NF, 2NF, 3NF, 4NF). Preparing and Designing Normalized Databases. Database Security Access Control and Privileges: Users, roles, and authorization. Data Security: Encryption, storing sensitive information. Responsibility for Data Security and Protection. Transaction Management in DBMS Transaction Concept: Definition and importance. ACID Properties (Atomicity, Consistency, Isolation, Durability). Managing Transactions and Ensuring Data Integrity. SQL Performance Optimization Indexes and Their Use: Increasing query speed. Query Optimization: Strategies for performance optimization. Analyzing Speed and System Resource Usage. Database Administration Managing Users and Privileges: User management systems. Backup and Data Recovery: Protocols and best practices for data protection. Updates and Maintenance: Monitoring and maintaining system performance. Distributed Databases and Distributed DBMS Concepts of Distributed

Databases: Data distribution and synchronization between systems. Managing Data in a Distributed Environment. Applications of Databases in Large Systems Use of Databases in Large-Scale Systems and Web Applications: CMS, ecommerce, etc. Real-Time Data and Analytics: The importance of databases for fast and accurate analysis. Review and Practical Application Projects Review of All Topics Covered. Practical Work and Group Projects: Assistance in designing and

Core Concepts

Course Outline

Week	Topic			
1	Introduction to Database Systems, Database System Concepts			
2	Entity-Relationship Model			
3	Enhanced Entity Relationship Model			
4	Relational Data Model			
5	Normalization			
6	Normalization			
7	Normalizing a database			
8	Midterm			
9	Introduction to SQL			
10	DML data manipulation instructions			
11	More DML instructions, DDL table creation instructions			
12	Introduction to MySQL, database design in MySQL			
13	Tables in MYSQL			
14	Retrive data from tables using MySQL statements			
15	Database Programming			
16	Final Exam			

implementing a complete database.

In-term Studies		Quantity	Percentage			
Course Ev	aluation					
5	Studenti ësh	Studenti është i aftë të administrojë një bazë të dhënash.				
4	Studenti arri	nti arrin të manipulojnë të dhënat e një bazë të dhënash me SQL dhe MySQL.				
3	Studenti njih	njihet me komponentët bazë të një RDBMS.				
2	Studenti arri	n të bëj query të thjeshta në databazë.				
1	Studenti arri	n të krijojë një bazë të dhenash të thjeshtë.				
Course Ou	tcome					
	References • Alba Como, Xheni Melo, Menaxhimi bazë të dhënash, 2018, EneaS, Tiranë.					
Literature		 Ch. FEHILY, SQL - Third Edition, 2008 Jay Greenspan and Brad Bulger, 'MySQL/PHP Database application', 2001, Published by M&T Books Emasri, Navathe, "Fundamentals of Database Systems", 2011 sixth edition, Addison Wesley. 				
	Prerequisites	The student must attend the course at a minimum rate of 75%.				

In-term Studies	Quantity	Percentage
Midterms	1	25
Quizzes	0	0
Projects	1	20
Term Projects	0	0
Laboratory	1	10
Class Participation	1	10
Total in-term evaluation percent		65
Final exam percent		
Total		100

ECTS Workload (Based on Student Workload)

Activities	Quantity	Duration (hours)	Total (hours)
Course duration (Including the exam week: 16x Total hours of the course)	16	4	64
Study hours outside the classroom (Preparation, Practice, etc.)	14	3	42
Duties	1	0	0
Midterms	1	10	10
Final Exam	1	10	10
Other	0	0	0
Total Work Load			126
Total Work Load / 25 (hours)			
ECTS			