Course Name : Database Management Systems

Course Code	Course Type	Regular Semester	Lecture (hours/week)	Seminar (hours/week)	Lab. (hours/week)	Credits	ECTS
CMP 402	B	Spring	3.00	1.00	0.00	3.50	6.00

Lecturer	Eris Zeqo, PhD
Assistant	Ahmet Fatih Ersoy, PhD
Course language	Albanian
Course level	Master
Description	This course is focused on advancing knowledge for the development of a database. Its purpose is to provide students with advanced knowledge in database design and the use of Structured Query Language (SQL). It also focuses on performance tuning and Web databases.
Objectives	Course objectives include deepening in concepts such as EER model, cluster, trigger, SDLC, DBLC, tuning etc. At the end of this course the student should possess advanced skills in designing databases and in using SQL codes. He is also familiar with the life cycle of a database and how to use an online database.
Core Concepts	1. Extended Entity Relationship Model (EERM) 2. Extended Entity Relationship Chart (EERD) 3. SQL functions 4. Advanced SQL 5. System Development Lifecycle (SDLC) 6. Database Life Cycle (DBLC) 7. Performance of SQL queries 8. Web Databases

Course Outline

Week	Topic
1	- Extended entity relationship model (EER model) - Entity clusters - Using them to represent multiple entities and relationships
2	- Convenient primary key features - How to select these keys - Use of flexible solutions for special cases of data modeling
3	- Relational operators UNION, UNION ALL, INTERSECT and MINUS - How to use JOIN advanced SQL syntax - Different types of subquery and related query
4	- SQL functions - Using them to manipulate dates, texts and other data - Create and use updatable views
5	- Triggers and stored procedures - Their creation and use - Creating embedded SQL
6	- Exercises in SQL - Practical examples
7	- Project I
8	- Adapting the design of the database to the information system where it belongs - Systems Development Life Cycle (SDLC) - Development of information systems within the framework of SDLC
9	- Evaluate and review databases in the Database Life Cycle (DBLC) framework - How the evaluation and review is performed within the SDLC and DBLC frameworks - Database design strategies
10	- Basic concepts for regulating database performance (tuning) - How DBMS processes SQL queries - The importance of indexes in processing SQL code
11	- Types of decisions a query optimizer should make - Common Practices for Writing Efficient SQL Code - How to formulate queries and adjust the DBMS for optimal performance

12	- Various technologies to connect to the database - Using intermediaries to integrate databases with the Internet - Plug-ins and extensions for browsers
13	- Services provided by Web application servers - What is XML and its importance in the development of Web databases - Cloud services features
14	- SQL data services and the impact on reducing costs for data management - Exercises
15	- Project II
16	Final Exam

Prerequisites	The student must attend the course at a minimum rate of 75%.
Literature	• Cikel Leksionesh
References	• Carlos Coronel, Steven Morris (2019). Database Systems - Design, Implementation, and Management (13th Edition), Cengage Learning, Inc.

Course Outcome

1	At the end of this course students should present a group project. The end result of the project should be the construction of a database testing it during the presentation of the project in the auditorium. This project can be an advancement of the project that students develop in the previous course "Databases I". The database that will be built during this project should contain the following features: - the use of heritage concepts in the construction of its structure - implementation of restrictions on maintaining the integrity and accuracy of data - implementation of elements for automation of data entry - structure for storing data history - use of triggers to automate work (and save history)

Course Evaluation

In-term Studies	Quantity	Percentage
Midterms	0	0
Quizzes	0	0
Projects	2	40
Term Projects	0	0
Laboratory	0	0
Class Participation	0	0
Total in-term evaluation percent		**40**
Final exam percent		**60**
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	2	14	28
Midterms	0	0	0
Final Exam	1	16	16
Other	0	9	0
Total Work Load			**150**
Total Work Load / 25 (hours)			**6.00**
ECTS			**6.00**