College of Computer Science and Information Systems | **Department of Computer Science**

Course Code : 380CSS-3 | **Fundamentals of Database Systems**

Contact Hour : 3(0) | **Prerequisite : N/A**

Coordinator -

2. Course Description

Study of fundamentals concepts of Databases, architecture of Database Management Systems (DBMS), and database design and database programming language. Topics include: different database design models such as entity relationship and Object-Oriented data model; relational database theories including normalization, functional dependencies and conversion of E/R data model to relational databases; theoretical database programming language such as relational algebra and calculus; Structured Query Language (SQL) including Data Definition Language (DDL) and Data Manipulation Language (DML); advanced SQL covers sub-queries and views, triggers.

3. Course Learning Outcomes

SL	By the end of this course, students should be able to:	Linkages to POs
1.	Explain the general concepts of database, database system, data, DBMS, database design, database programming languages	a(S)
2.	Design the E/R diagram data model for a realistic application	c(S)
3.	Construct an Object-Oriented data model for simple application	c(S)
4.	Create a normalized, well-structured relational data model using theories (normalization, etc.) of relational database	i(S)
5.	Write statements in SQL data definition language (Create, etc.) and data manipulation language (select, etc.) in order to manage relational database schemas and instances.	c(W),i(S)
6.	Solve effectively in teams the course project goal within time and resource constraints	c(W),i(S)
7.	Practice communication skills in writing and presenting the course project.	d(S)

4. Learning Resources

Text	Fundamentals of Database Systems, 6th (or 5th, 4th, 3rd) edition, Elmasri&Navathe, Addison-Wesley, 2007. ISBN: 0-321-36957-2
Reference	Database System Concepts Silberschatz, Korth, Sydarshan. McGraw-Hill. Either 5th edition 2005 or 4th edition, 2002. ISBN 0-07-295886.

5. Course Content : The list below provides a summary of the material that will be covered during the course

Week	Topics	References Book / Others Source	Special Event	Tutorial Activities	Lab Activities
1.	Introduction to Databases and DBMS	3-27,29-52			
2.	Structured Query Language Statements(SQL)	243-283		Database Versus File Systems.	Install database Server (e.g. MySQL) and sample SQL queries
3.	Structured Query Language Statements(SQL)	243-283	Quiz-1	Database Versus File Systems.	Install database Server (e.g. MySQL) and sample SQL queries
4.	Data Modeling Using Entity Relationship Model (E/R)	57-131		Exercises to create E/R diagrams	Basic SELECT Statement

5.	Data Modeling Using Entity Relationship Model (E/R)	57-131	Project	Exercises to create E/R diagrams	Restricting and Sorting Data
6.	Relational Data Model and Relational Database Constraint	145-165	Mid-Term 1		Using DDL Statements to Create and Manage Tables
7.	Relation database design by ER â€“and EE/R- to-Relation mapping	225-238		Exercises to convert E/R to relations	DML Statements to manipulate data (insert, update, delete).
8.	Functional Dependencies	337-356			Group Function and having with group function.
9.	Normalization	357-373		Exercises in Normalization	Join
10.	The Relational Algebra and Relational Calculus	151-189	Mid-Term 2 (TBD)	Exercises in relational algebra	subquires
11.	Object Oriented Database	729-747	Quiz 2		Set operators
12.	Advanced SQL	207-289		Exercises in Advanced SQL	Triggers and views
13.	project				

6. Evaluation Scheme: The following list is the contribution of course components to the final grade for the course.	
Component	Weight (%)
Quizzes	2
Course Project	8
Mid-Term Examinations	30
Lab report and assignment	10
Final Lab Test	10
Final Exam	40
Total	100