CPCS-241 Syllabus

Catalog Description

CPCS-241 Database (I)
Credit: 3 (Theory: 3, Lab: 0, Practical: 1)
Prerequisite: CPCS-204
Classification: Department Required

This objective of this course is to introduce students to database management systems. Topics include Data, Information, File System, Database and Database Users, Database System Concepts and Architecture, Data Modeling using the Entity Relationship (ER) Model, The Relational Data Model and Relational Database Constraints, Functional Dependencies and Normalization for Relational Databases, The Relational Algebra and Relational Calculus, Relational Database Design by ER and EER to Relational Mapping, Disk Storage, Basic File Structure and Hashing, SQL-99 Schema Definition, Constraints, Queries and Views (DDL and DML).

Class Schedule

Meet 50 minutes 3 times/week or 80 minutes 2 times/week

Lab/Tutorial 90 minutes 1 times/week

Textbook

Ramez Elmasri, Sham Navathe, , "Fundamentals of Database Systems", Addison Wesley Longman; 6 edition (2011)

ISBN-13 9780136086208 **ISBN-10** 0136086209

Grade Distribution

Week	Assessment	Grade %
5	Homework Assignments 1	5
6	Exam 1	10
6	Graded Lab Work 1	2.5
10	Group Project	25
11	Graded Lab Work 2	2.5
11	Homework Assignments 2	5
12	Exam 2	15
15	Lab Exam	5
16	Comprehensive Final Exam	30

Last Articulated

December 13, 2017

Relationship to Student Outcomes

a	b	c	d	e	f	g	h	i	j	k
x	x	x						x		x

Course Learning Outcomes (CLO)

By completion of the course the students should be able to

1. Explain the characteristics that distinguish the database approach from the approach of programming with data files (a)
2. Identify major DBMS functions and describe their role in a database system (a)
3. Explain the concept of data independence and its importance in a database system (a)
4. Describe data models, schemas, and instances (a)
5. Demonstrate the concepts of entity integrity constraint and referential integrity constraint. (a)
6. **Apply concepts in ER modelling notation to model a real world problem. (c)**
7. Use a relational database schema in SQL that incorporates key, entity integrity, and referential integrity constraints. (i)
8. **Use SQL queries for data aggregations, calculations, views, sub-queries, embedded queries, manipulation and report generation (i)**
9. Write simple queries in relational algebra and relational calculus (k)
10. **Prepare a relational schema from a conceptual model developed using the entity- relationship model. (c)**
11. **Apply normalization techniques to relational database tables. (i)**
12. Evaluate a proposed decomposition to determine the degree of its normal form. (i)
13. Explain the impact of normalization on the efficiency of database operations especially query optimization. (b)
14. **Describe file structures, indexing and hashing techniques. (a)**
15. Describe the concepts of information storage, retrieval, capture, representation and searching. (a)

Coordinator(s)

Dr. Manar Ali, Associate Professor

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Topics Coverage Durations

Topics	Weeks
Database and Database users Orientation	1
Database System Concepts and Architecture	1
The Relational Data Model and Relational DB Constraints	2
Basic SQL	2
Data modeling using the ER model	1
Relational DB design ER-to-Relational mapping	1
Basics of functional dependencies and normalization for relational DB	2
Complex SQL	1
The Relational Algebra and Relational Calculus	1
File structures, indexing, and hashing	1
Information Management Concepts	1