King Fahd University of Petroleum and Minerals

Department of Information and Computer Science

Semester 2006-2007 (062)

ICS 324 Database Systems (3-0-3) (Sections 02, 52, 53)

1. Instructor

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Office	22/124-6
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Class	ICS324-02: S M W 10:00 - 10:50 pm 24/244 ICS324-52: M 02:10 - 05:10 pm 22/336 (Lab) ICS324-53: T 11:10 - 02:10 pm 22/336 (Lab)

2. Course

Course Objectives

1. **[Basic Concepts & Features of Database Systems]**
   To understand the basic concepts of databases, RDBMS and database theory.
2. **[Database Design Models & Methodology]**
   To understand database design, development, and implementation.
3. **[Advanced topics]**
   To introduce advanced topics like query processing & optimization, concurrency, and recovery.
4. **[Practice with A Real Database Management System]**
   Get an experience to work in a team environment.

Catalog Description

Basic database concepts. Conceptual modeling. Relational data model. Relational theory and languages. Database Design. Introduction to query processing and optimization. Introduction to concurrency and recovery.

Course Learning Outcomes

1. Upon completion of the course, students will be able to:
2. Explain the basic database, DBMS concepts and database theory.
3. Understand and develop relational/ conceptual data model.
4. Use and apply database programming languages and physical database design.
5. Understand the basics of query processing and optimization, concurrency controls and database recovery.
6. Gain work experience in a lab project as a team member or leader.

Prerequisite: ICS 202 – Data Structures

Textbook

Recommended:
"Fundamentals of Database Systems" by R. Elmasri and S. B. Navathe, 4th edition, Addison-Wesley, 2003; ISBN: 0-321-20448-4.

Reference:
"Database System Concepts" by Henry F. Korth and Abraham Silberschatz (K&S),
4th edition, McGraw-Hill, ISBN: 0-07-112268-0
"Oracle PL/SQL, Developer 6i" by Ejaz Ahmed, 3rd Edition (Available at KFUPM library)

Grading

Quizzes	----------	10 %
Home Work	----------	10 %
Exam I	----------	15% (19-MAR-2007: MON 8:00-10:00pm Loc TBD)
Exam II	----------	15 % (23-APR-2007: MON 8:00-10:00pm Loc TBD)
Final Exam	----------	25% (Total Marks: 75, plus 25 Lab work)

Course Outline

S#	Topic	Chapter	# Of Lectures/ Week	Exam	Quiz	HW
1	Basic Database Concepts and Database Architecture	[1, 2]	4 (Week-1)	1		
2	The Relational Data Model, SQL	[5], [8]	7 (Week-3,4)	1	2	*
3	Relational Algebra	[6.1 – 6.5]	3 (Week-5)	1		*
4	Conceptual Modeling (ER)	[3]	3 (Week-2, 3)	2	1	
5	EER & Mapping	[4, 7]	4 (Week-7)			
6	Relational Calculus & QBE *	[K&S] or 6.6-6.7	3 (Week-6)	2		*
7	Functional Dependencies and Normalization	[10]	4 (Week-8)	2	3	
8	Information Models & Systems, Practical Database Design **(Self Study)**	[12.1, 12.2, 16]	3 (Week-9, 10)	2		
9	Files Organization	[13.3, 13.5, 13.6, 13.7, 14.1]	3 (Week-11, 12)		4	
10	Advanced Topics (Query Optimization, Transaction Processing & Concurrency Control, Backup & Recovery)	[15.1, 17.1, 17.2, 17.3, 18.1, 18.2]	5 (Week-14)			
11	Physical Database Design & Performance Tuning **(Self Study)**	[16]	1(Week-15)			

* Course material is selected from a reference book (K& S).

3. General Policies

Attendance

- Regular attendance is the university requirement. Attendance will be taken in the beginning of every class.
- Whenever the number of unexcused absences exceeds **20%** of the held classes, the grade DN will be reported without any formal warning.
- Final exam will be selective comprehensive.

Home Work Submission

- The home work can be submitted in a class on the due date.
- Any late submission will not be accepted.

Class Discussion

- Participation in class discussion is very much encouraged. Asking questions during lectures helps both the instructor and the student. The instructor gets the feedback and the students get the point clarified. Active learning will be a part of it.

Grading Issues

- All the grading issues must be resolved within a week after the return of graded material.
- Exam grades will be submitted a week after the exam date.
- Only 4 quizzes will be considered in the final grade.

Make Ups

- No make up exams will be given.

Software Applications' Standards

- Oracle 9i/ 10g, MS Access, MS SQL & Oracle SQL standards (ANSI standards)