Al Imam Mohammad ibn Saud Islamic University
College of Computer and Information Sciences

Information Systems Department

Course Syllabus
IS321 - Database Management Systems

Catalog Description:

This course is intended to give students a solid background in database management systems and database maintenance. Such systems will be examined from two perspectives: 1. as a database system user, and 2. as a database system administrator. First, the course will cover the basic structure and capabilities of a database system, and will examine the process of designing a database and using a database system. Second, the course will teach student to understand the implementation of database system.

The students will be familiar with centralized systems, client–server systems, parallel and distributed architectures, and network types. Its main focus is towards the fundamentals of a transaction-processing system, including transaction atomicity, consistency, isolation, and durability, as well as the notion of serializability.

Students will be exposed to the concurrency control mechanism and several techniques for ensuring serializability, including locking, time stamping, and optimistic (validation) techniques. They will also be learning deadlock issues like deadlock detection and deadlock recovery.

At the end of the course, students are expected to be familiar with database administration and creating and configuring an Oracle database. Particular attention will be paid towards managing users and securing the Database as well as monitoring database operations. Database maintenance is also another main focus of the course.

Credit Hours: 3 Credit hours: 3 Lectures per week   0 Labs. per week   0 Recitation per week

Prerequisites: IS220 – Introduction to Database

Course Learning Outcomes:

1. Describe the different database system architectures and their advantages and disadvantages.
2. Define transaction processing
3. Summarize the basics of database management and administration.
4. Apply basic level functionality provided by typical database management systems, to an extent sufficient to select and utilize a DBMS to support real world

applications.

5. Explain the manner in which database systems support atomicity, concurrency, isolation and durability.
6. Use different recovery management techniques.
7. Use the various concurrency control protocols.
8. Work effectively in groups and exercise leadership when appropriate
9. Communicate effectively in oral and written form

Major Topics:

- Introduction, Centralized Architectures; Client-Server Architectures; Parallel Systems; Distributed Systems; Network Types;
- Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Transaction Definition in SQL, Testing for Serializability
- Concurrency Control - Lock-Based Protocols, Timestamp-Based Protocols, Validation-Based Protocols, Multiple Granularity, Deadlock Handling, Insert and Delete Operations
- Recovery Management- Failure Classification, Storage Structure, Recovery and Atomicity, Log-Based Recovery, Shadow Paging, Recovery With Concurrent Transactions, Buffer Management, Failure with Loss of Non-volatile Storage, Remote Backup System
- Oracle Database Administration and Project Discussions

Text Books:

- Database System Concepts, 6/E, Abraham Silberschatz, Henry Korth, S. Sudarshan, McGraw-Hill , Pub. Company, 2010. ISBN-13: 978-0073523323.
- Oracle Database 11g The Complete Reference (Oracle Press, Kevin Loney, McGraw-Hill Osborne,2009, ISBN-10: 0071598758 , ISBN-13: 978-0071598750

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Grading:

- The grading scale for this course is:

  95 - 100 A+   Passing
  90 - 94   A   Passing
  85 - 89   B+   Passing
  80 - 84   B   Passing
  75 - 79   C+   Passing
  70 - 74   C   Passing
  65 - 69   D+   Passing
  60 - 64   D   Passing
  0 - 59   F   Failing

- Final grades will be determined based on the following components:
  . 60% Semester Work
  . 40% Final Exam

- Students may not do any additional work for extra credit nor resubmit any graded activity to raise a final grade.

- Late submissions will not be accepted for any graded activity for any reason.

- Students have one week to request the re-grading of any semester work.

Attendance Policy:

Students should attend 80% of the overall course hours taught in the semester as per the University regulations.

If a student fails to achieve this portion, he/she shall not be allowed to appear in the final exam and shall be awarded "DN" grade and repeat the course.

Cheating and Plagiarism Policy:

The instructor will use several manual and automated means to detect cheating and/or plagiarism in any work submitted by students for this course.

When a student is suspected of cheating or plagiarism, the instructor raises the issue to the disciplinary committee.

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Communications:	Registered students will be given access to a section of the Learning Management System (LMS) for this course. LMS will used as the primary mechanism to disseminate course information, including announcements, lecture slides, assignments, and grades.
	Communication with the instructor on issues relating to the individual student should be conducted using CIS email, via telephone, or in person.