CS 4513 Database Management
Fall 2008 Syllabus

Administrative Information

- **Instructor**: Dr. Yifei Dong, Engineering Lab 154, dong@ou.edu, 405-325-6165
- **Classes at**: Monday/Wednesday, 1:30 PM - 2:45 PM, Sarkeys Energy Center M0204

Course Description

This course emphasizes concepts and structures necessary to design and implement a database management system.

Prerequisite Skills

- Experience of implementing and using data structures (CS 2413)
- Good understanding of discrete structures (CS 2813)

Learning Objectives

- Relational Databases Concepts and Languages (Ch. 1-4)
  - Be familiar with the basic concepts and terminologies
  - Understand the formal definitions of relational algebra
  - Be able to write expressions in relational algebra for data manipulation (queries, updates, insertions, and deletions)
  - Understand SQL’s fundamental constructs and concepts
  - Be able to write SQL statements for data manipulation
  - Be able to write SQL programs, including embedded programs in other programming languages
- DBMS Design (Ch. 6-8)
  - Be able to develop high-level data model using entity-relationship (E-R) diagram
  - Be able to represent relation schema and constraints from E-R design
  - Understand the rationales, definitions, and tradeoffs of different normal forms
- XML (Ch. 10)
  - Be familiar with the key terminologies of XML standards
  - Be able to define relational schema in DTD and XML schema
  - Be able to use XML query languages and API
- Implementation of Data Storage and Querying (Ch. 11-14)
  - Be familiar with database storage architecture
  - Understand the algorithms and techniques of efficient database file organization
  - Understand and be able to analyze query processing and optimization
- Transaction Management and Database Architecture (Ch. 15, 20)
  - Understand the basic concepts of concurrent transactions and ACID properties
Be familiar with various large-scale database-system architectures
- Database Systems Case Studies (Ch. 26-29 and online materials)
  - Compare the difference of various database systems used in industry
  - Discover how they support the database concepts and standards

References and Resources

Required Textbook

Recommend Readings
- Various online resources
- Source code of open source database systems, such as MySQL, PostgreSQL, SQLite

Workload and Grading

Individual Homework
There will be assignments to be finished by each individual alone. All homework should be submitted by their posted deadline, which is normally one week after the posting date unless otherwise announced. Partial credit may be given for unfinished assignments submitted on time.

Team Project
There will be one term-long project to be completed by a team of 4-5 students.

Written Tests and Examinations
- **Online self-tests**: There are online quizzes through learn.ou.edu for the students to self-test their understanding of course materials. Quizzes are available during limited time and scores will be recorded automatically.
- **Final Examination**: There are one close-book final examination.

Grading
The final grade is made up of the above components according to the following weights, which are subject to minor change when necessary:
- Individual homework: 30%
- Team projects: 30%
- Tests: 40%
• Bonus: up to 10%

All grades are final one week after grading. The grading scale is \( A=[90,\infty) \), \( B=[80,90) \), \( C=[70,80) \), \( D=[60,70) \), \( F=[0,60) \).

**Policies**

**Class Attendance**

The students are expected to attend each class meeting, because the course demands active participation from each student and random quizzes may be held. If a student is unable to attend to attend a meeting, he/she should send a prior notice to the instructor, so that corresponding arrangement can be made to assure everybody is on the same line. In case of unforeseeable event, explanations afterward are also needed and accepted. One who is absent without any notice and explanation is responsible for his/her own loss. *Absence from team meeting will be penalized.*

**Scholastic Conduct**

All work submitted from an individual should be the work of that single individual. In written assignments, references must be cited where the idea or text is presented; otherwise it is considered as plagiarism. Direct copying of computer code from any resource other than the examples in the textbooks and lectures is also considered as academic misconduct.

Any academic misconduct will be documented and handled immediately, including being admonished or being reported to the Campus Judicial Coordinator with a request that a grade of F be given in the class to all participants.

Official documents:

• [University of Oklahoma Academic Misconduct Code](http://www.ou.edu/studentcode)
• [A Student's Guide to Academic Integrity](http://www.ou.edu/provost/integrity/)
• [Your right to appeal](http://www.ou.edu/provost/integrity-rights)

**Incomplete**

The grade of I is intended for the rare circumstance when a student has been successful in a class has an unexpected event occur shortly before the end of the class. An incomplete will not be considered unless the following has three conditions have been met:

• It is within two weeks of the end of the semester.
• The student is above the average of C or better in the class.
• The reason that the student cannot complete the class is properly documented and compelling.
Making up an incomplete grade will usually require completing a new project the following year.

**Accommodation**

Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact the instructor personally as soon as possible so that necessary accommodations can be discussed to ensure full participation and facilitate the student's educational opportunities.