CS 275 – Introduction to Databases

Catalog Description: Design and implementation of relational databases, including data modeling with ER or UML diagrams, relational schema, SQL queries, relational algebra, user interfaces, and administration.

Credits: 4

Prerequisites: CS 162

Courses that require this as a prerequisite: CS 440

Structure: Three 50-minute lectures or two 80-minute lectures per week

Instructor: Eugene Zhang

Course Content:
- Data Management Fundamentals:
  - Integrated data management
  - Conceptual schema, internal schema, and external schemas.
- Relational Database Systems:
  - Creating a relational database
  - Formulating SQL queries
  - Creating indices to improve performance
- Data Modeling:
  - Creating entity-relationship diagrams
  - Converting an E-R schema into a relational schema
- Web-Based Database Access:
  - HTTP protocol and CGI
  - Server-side scripting in PHP
- Relational Algebra
  - Query formulation
  - Simple query optimization

Learning Resources:
- Raghu Ramakrishnan and Johannes Gehrke,, *Database Management Systems*, McGraw Hill, ISBN 0-07-246563-8 (required)
- Hugh E. Williams and David Lane, *Web Database Applications with PHP & MySQL,* O'Reilly (optional)
- MySQL DBMS, Apache 2 Web-server, PHP 5, CASE tools for data modeling, and Web-application generator

Course Learning Outcomes: (* indicates quantitative outcome—see Criterion 4)
At the completion of the course, students will be able to…
1. **Describe** the difference between a relational database and a flat file (ABET Outcomes: A, J)

2. **Model** a moderately complex data set by using an ER or UML diagram, and **derive** a relational schema from that diagram (ABET Outcomes: A, B, C)
3. **Create** a relational database from a relational schema (ABET Outcomes: A, C, K)
4. **Create** multiple indices in a relational database, and **explain** when and why such indices are appropriate (ABET Outcomes: A, B, C)
5. **Formulate** SQL statements for data manipulation (ABET Outcomes: A, C)
6. **Formulate** simple queries in relational algebra by using projection, selection, product, and join operations (ABET Outcomes: A, I)
7. **Describe** the components and interfaces of a Web-based database system (ABET Outcomes: A, B, I)
8. **Design** and **implement** a Web-based relational database system, using one or more scripting languages (e.g., PHP) and an open-source database development system (e.g., MySQL)* (ABET Outcomes: A, B, C, I, K)

Students with Disabilities:
Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098.

Link to Statement of Expectations for Student Conduct, i.e., cheating policies
http://oregonstate.edu/admin/stucon/achon.htm