

Syllabus

Handout 1

Aug. 22nd, 2007

Location: OHR 226 (Oliver H. Raymond Civil Engineering Building)

Time: MWF 10:00 AM - 10:50 AM

URL: <http://protocols.netlab.uky.edu/~liuj/teaching>

Instructor

Jinze Liu

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Office hours: MW 11:00 AM - 12:00 AM (or by appointment)

Location : 237 James F. Hardymon Building

Textbooks

(Required) Fundamentals of Database Systems

by Ramez Elmasri and Shamkant B. Navathe

Addison Wesley, 2007

ISBN-10: 0321369572

(Supplementary) Database Systems: The Complete Book (DS:CB)

by Hector Garcia-Molina, Jeff Ullman, and Jennifer Widom

Prentice-Hall, 2002

ISBN-10: 0130319953

(Link: <http://infolab.stanford.edu/~ullman/dscb.html>)

Description

Study of fundamental concepts behind the design, implementation and application of database systems. Brief review of entity-relationship, hierarchical and network database models and in-depth coverage of the relational model including relational algebra and calculi, relational database theory, concepts in schema design and commercial database languages.

Prerequisite

CS 315 and graduate or engineering standing

Needed Skills: Ability to design, code and debug nontrivial programs in C(C++), Java or Python. Some knowledge of computer hardware organization.

Learning Outcomes

At the conclusion of the course, the successful student will be able to:

1. understand and appreciate the theoretical foundation of database systems
2. write SQL queries of moderate complexity
3. create a web front end to a database application
4. use sound design principles when defining a database
5. understand through hands-on experience the file management techniques used by database systems.

Grading

The grade will be determined by homework and programming assignments, a midterm exam and a final exam. The tentative weights are as follows:

6 Homework assignments	30%
Project	25%
Midterm exam	20%
Final exam	25%

Final grades will be assigned according to the following scale:

A=90-100%, B=80-89%, C=70-79%, D=60-69%, E=0-59%.

For graduate students, grade D will automatically be replaced by E. Also, any grade normalization will be done against peer students, i.e. undergraduates will only be normalized with undergraduates, and graduates with graduates.

No incomplete grades will be assigned unless there exist exceptional, extenuating circumstances.

Late programs or homework will be penalized 10% per day for each day late. No programs or homework will be accepted if they are late for more than 3 days.

Academic Conduct Expectations

Students are expected to complete all assignments independently. Honest and ethical behaviors are always expected. There will be no tolerance for plagiarism or other academic misconduct. The minimum punishment is an E grade that cannot be removed by the repeat option. You may read U.K. Student Rights and Responsibilities at <http://www.uky.edu/StudentAffairs/Code> for a detailed description.

Topics Covered (Tentative)

- Chapter 1: Databases and Database Users
- Chapter 2: Database Systems Concepts and Architecture
- Chapter 3: Data Modeling Using the Entity-Relationship Model
- Chapter 5: The Relational Data Model and Relational Database Constraints
- Chapter 6: Sections 6.1 - 6.5, Relational Algebra
- Chapter 7: Relational Database Design by ER- and EER-to-Relational Mapping
- Chapter 10: Functional Dependencies and Normalization for Relational Databases
- Chapter 11.3: Fourth Normal Forms
- Chapter 8: SQL-99: Schema, Definition, Basic Constraints and Queries
- Chapter 9: More SQL: Sections 9.1 - 9.3
- Chapter 12.2: The Database Design and Implementation Process
- Chapter 13: Disk Storage, Basic File Structures, and Hashing
- Chapter 14: Indexing Structures for Files
- Chapter 15: Sections 15.1 - 15.7 (especially 15.3, 15.4, 15.7, exclude 15.6)
- Chapter 17: Introduction to Transaction Processing Concepts and Theory
- Chapter 18: Concurrency Control Techniques
- Chapter 19: Database Recovery Techniques