

22C:144 – Introduction to Database Systems Fall 2003

Instructor: Dr. Ramon Lawrence
Class Schedule: 1:05 – 2:20 p.m. Tuesday/Thursday
Location: 105 MH (MacLean Hall)
Office Hours: 11:00–12:00 a.m. Tues/Thurs and 3:00-4:00 p.m. Tuesday or by appointment
Office Location: 201L MacLean Hall
Phone: 335-0561
E-mail: ramon-lawrence@uiowa.edu (preferred contact method)
Course URL: <http://www.cs.uiowa.edu/~rlawrenc/teaching/144/index.html>

Course Description

This course provides an introduction to database systems including database querying, design, and programming. The course consists of three major components. The first component explains databases from a user perspective including how to query using SQL, relational algebra, and other query languages. The second component involves designing relational databases using Entity-Relationship (ER) diagrams and other modeling languages. The last part involves database programming with current technologies such as JDBC, XML, PHP, and JSP. Students completing the course have experience with current database technologies, and the ability to use and develop databases and associated applications.

Prerequisite

- grades of C- or higher in 22C:030 and 22C:034

Marking and Evaluation

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|----------------------|---|
| Assignments | 15 % (approximately 4 assignments) |
| Project | 25 % |
| Mid Term Exam | 20 % (75 minutes in class) |
| Final Exam | 40 % (cumulative, two hours) |

This course will use +/- grading. No late assignments will be accepted.

Textbook and Reference Material

Thomas Connolly and Carolyn Begg, *Database Systems: A Practical Approach to Design, Implementation, and Management*, Addison Wesley, 3rd edition, ISBN 0-201-70857-4, 2002.

Alternate Textbook: Hector Garcia-Molina, Jeffrey Ullman and Jennifer Widom, *Database Systems: The Complete Book*, Prentice Hall, ISBN 0-130-31995-3.

Teaching Assistant

Eduard Dragut, eduard-dragut@uiowa.edu, Office: 201N MacLean Hall
Office Hours: **Monday: 10:30 - 12:00 and Friday: 10:30 - 12:00**

Expectations

- I expect students to attend **all** classes and prepare before attending class. This includes reading relevant sections of the textbook and reviewing notes from previous lectures.
- I recommend all students download and read a copy of the lecture notes **before** the lecture.
- I expect all students to learn the material in the course and undertake sufficient effort to produce all the programming assignments and quality projects.
- I want all students to enjoy attending class and feel free to participate according to their own personalities. Feel free to ask questions by raising your hand or speaking out at appropriate moments.
- Please actively participate in class discussions, questions, and problem solving exercises.
- **I want all students to pass the course, receive a good grade, and feel the course was beneficial.**

Grievances and Complaints Procedures

If you have any grievance or complaint about course direction, your treatment during class, your assigned marks, or any other problem, please first talk to your professor about the situation. I am very approachable and will work hard to ensure the course is enjoyable for you.

If there is a situation that cannot be resolved in this manner, please contact the Chair of the Department of Computer Science, Professor James Cremer, at 14D MacLean Hall, 335-0736.

Academic Dishonesty

A student must submit original work of his or her own construction. Academic dishonesty in the form of copying assignments, projects, or exams from other students or sources is not permitted. If you have any questions about what constitutes academic dishonesty, please contact your professor or consult the printed policy in the *Schedule of Courses* and the *CLAS Bulletin*.

Students with Disabilities

I would like to hear from anyone who has a disability that may require some modification of seating, testing, or other class requirements so that appropriate arrangements can be made. Please see me after class or during my office hours.

Missing an Exam

Only students who miss an exam for a reason that corresponds to the University of Iowa's policy on "Excused Absences from Examinations" will be permitted to take the exam at a later time. Please note that a make-up exam may have a question format that is different from the regular exam. You must complete an "Explanatory Statement of Absence from Class" [form](#) (available at the Registration Center) and present it to the professor for evaluation. If the reason for absence is satisfactory, the student may either take the exam, or if a midterm exam is missed, the midterm exam can be forfeited and the student's final exam will be worth more of the final grade.

Course Outline

The course has a substantial amount of material to be covered in a short time. This requires the student make a strong effort to keep up with the material discussed in class. Below is an outline of the topics covered. The professor is not bound to the topics, timelines, and outline provided as they only serve as a general reference.

| Date | Topics Covered and Description |
|------------------------|---|
| August 26 (T) | First day of classes. Introduction to course, discuss syllabus, WebCT |
| August 28 (TH) | Database terminology and architectures (Chapters 1 and 2 except 2.6-2.7) |
| September 2 (T) | Relational Model - Schemas, Keys, Constraints, Integrity (Sections 3.1-3.3) |
| September 4 (TH) | Relational Algebra - Select, Project, Set Operations (Section 4.1) |
| September 9 (T) | Relational Algebra - Cartesian Product, Joins, Division (Section 4.1) |
| September 11 (TH) | SQL - Simple Queries (Sections 5.1-5.3) |
| September 16 (T) | SQL - Distinct, *, Group By, Aggregate Functions, LIKE operator (Section 5.3) |
| September 18 (TH) | SQL - Nested subqueries, Set Operations, Outer Joins (Sections 5.3.5, 5.3.6, 5.3.7) |
| September 23 (T) | SQL - Recursion (SQL99), Insert, Update, Delete, Transactions (Section 5.3.10) |
| September 25 (TH) | Database Programming - JDBC API (Connection, Query, ResultSet) (Section 28.8) |
| September 30 (T) | Database Programming - C++, ODBC API, Embedded SQL, JSP (Chapter 21) |
| October 2 (TH) | DB Application Development - GUIs and controls |
| October 7 (T) | DB Application Development - data validation |
| October 9 (TH) | Database Design - General Approach (Chapters 9 and 10) |
| October 14 (T) | Midterm Review. |
| October 16 (TH) | Midterm Exam in Class. |
| October 21 (T) | ER Model (Chapter 11) |
| October 23 (TH) | ER design examples and mapping to relations |
| October 28 (T) | EER Design - Specialization, Generalization, Aggregation (Chapter 12) |
| October 30 (TH) | EER Design examples and brief introduction to UML |
| November 4 (T) | Relational Design - Functional Dependencies and Normalization (Chapter 13) |
| November 6 (TH) | 5 Normal Forms, BCNF, multi-valued dependencies (Chapter 13) |
| November 11 (T) | SQL DDL - Creating tables, views, and constraints (Chapter 6) |
| November 13 (TH) | SQL DDL - Security (Grant/Revoke), Indexes, Database Tuning (Chapter 6) |
| November 18 (T) | Commercial Database Systems - Access and SQL Server (Section 8.1) |
| November 20 (TH) | Commercial Database Systems - MySQL, Oracle (Section 8.2) |
| November 25 (T) | No classes. THANKSGIVING BREAK. |
| November 27 (TH) | No classes. THANKSGIVING BREAK. |
| December 2 (T) | XML - XQuery and XPath |
| December 4 (TH) | Data warehousing and Data Mining (Parts of Chapters 30, 31, and 32) |
| December 9 (T) | Project Results and Presentations |
| December 11 (TH) | Final exam review |
| December 16 (T) | Final Exam Date: Tuesday, December 16th at 12:00 noon in 105 MH |