22C:144 – Database Systems
Fall 2005

Instructor:	**Dr. Ramon Lawrence**
Class Schedule:	10:55 a.m. – 12:10 p.m. Tuesday/Thursday
Location:	2217 SC (Seamans Center)
Office Hours:	1:00–2:30 p.m. Tuesday and 1:30-3:00 p.m. Wednesday 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:021 and 22C:022

Marking and Evaluation

Assignments	**20 %**	(approximately 6 assignments)
Project	**20 %**	
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 (*Optional*)

Recommended: Thomas Connolly and Carolyn Begg, *Database Systems: A Practical Approach to Design, Implementation, and Management,* Addison Wesley, 4th edition, ISBN 0-321-29401-7, 2005.

Alternate Textbook: 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

Terry Mason, tmason@cs.uiowa.edu, Office: 317 MacLean Hall
Office Hours: **Monday and Friday 1:30 - 3:00 p.m.**

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 times.
- 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.**

Homework Expectation
For this three-credit-hour course, it is expected that you will spend *at least six hours per week in out-of-class preparation*.

Grievances and Complaints Procedures
A student who has a complaint related to this course should follow the procedures summarized below. The full policy on student complaints is on-line in the College's Student Academic Handbook.
• The student should attempt to resolve the matter with the instructor first. Students may talk first to someone other than the instructor if they do not feel, for whatever reason, that they can directly approach the instructor.
• If the complaint is not resolved to the student's satisfaction, the student should go to the course supervisor (if the instructor is a teaching assistant) or to the departmental executive officer: Professor James Cremer, at 14D MacLean Hall, 335-0736.
• If the matter remains unresolved, the student may submit a written complaint to the associate dean for academic programs.

Your Responsibilities
Your responsibilities to this class and to your education as a whole include attendance and participation. You have a responsibility to help create a classroom environment where all may learn. At the most basic level, this means you will respect the other members of the class and the instructor and treat them with the courtesy you hope to receive in return. Inappropriate classroom behavior may include: disruption of the classroom atmosphere, engaging in non-class activities, talking on a cell-phone, inappropriate use of profanity in classroom discussion, use of abusive or disrespectful language toward the instructor, a student in the class, or about other individuals or groups.

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*. This course is given by the College of Liberal Arts and Sciences. This means that class policies on matters such as requirements, grading, and sanctions for academic dishonesty are governed by CLAS. Students wishing to add or drop this course after the official deadline must receive the approval of the Dean of the CLAS. Details of the University policy of cross enrollments may be found at: http://www.uiowa.edu/~provost/deos/crossenroll.doc.

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 may 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 23 (T)	**First day of classes. Introduction to course/databases** (Chapters 1 and 2)
August 25 (TH)	Relational Model - Schemas, Keys, Constraints, Integrity (Sections 3.1-3.3)
August 30 (T)	Relational Algebra - Select, Project, Set Operations (Section 4.1)
September 1 (TH)	Relational Algebra - Cartesian Product, Joins, Division (Section 4.1)
September 6 (T)	SQL - Simple Queries, LIKE operator, Set Operations, Order By (Sections 5.1-5.3)
September 8 (TH)	SQL - Group By, Aggregate Functions (Section 5.3)
September 13 (T)	SQL - Subqueries, Insert/Delete (Section 5.3)
September 15 (TH)	SQL DDL – Create table, constraints, create indexes (Chapter 6)
September 20 (T)	Database Design – General Approach (Chapters 9 and 10)
September 22 (TH)	ER and UML Modeling (Chapter 11)
September 27 (T)	ER and UML Modeling examples and questions
September 29 (TH)	EER Design - Specialization, Generalization, Aggregation (Chapter 12)
October 4 (T)	ER/EER Mapping to Relational model
October 6 (TH)	Database Programming – JDBC, ODBC, Embedded SQL (Appendix E, Section 29.7)
October 11 (T)	Midterm Review.
October 13 (TH)	**Midterm Exam in Class.**
October 18 (T)	Web programming – Web servers and databases, JSP/servlets (Chapter 29)
October 20 (TH)	Web programming (cont.)
October 25 (T)	Relational Design - Functional Dependencies and Normalization (Chapters 13 and 14)
October 27 (TH)	Relational Design (cont.) – 1NF, 2NF, 3NF
November 1 (T)	Relational Design (cont.) – 4NF, 5NF, multivalued dependencies
November 3 (TH)	Advanced SQL – SQL:2003, recursion, object-relational databases, transactions
November 8 (T)	Advanced SQL DDL – Views, Security, and Triggers
November 10 (TH)	XML Introduction (Chapter 30)
November 15 (T)	XML – XQuery and XPath
November 17 (TH)	**Initial Project Demonstrations.**
November 22 (T)	**No classes. THANKSGIVING BREAK.**
November 24 (TH)	**No classes. THANKSGIVING BREAK.**
November 29 (T)	Data warehousing and Data Mining (Parts of Chapters 31-34)
December 1 (TH)	Database System Implementation – Storage, Transactions, Concurrency, Recovery
December 6 (T)	**Final Project Demonstrations.**
December 8 (TH)	Final exam review.
December 14 (T)	**Final Exam Date: Wednesday, December 14th at 7:30 a.m. 2217 SC**