CSE 462
Database Concepts
Fall 2000

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Course Objective

Database refers to a collection of large amount of data managed by a database management system (DBMS). A DBMS is a collection of interrelated files and a set of programs that allow users to access and modify these files. In this course we will study the fundamental concepts and issues in specification and design of a database, database languages, and database implementation. Majors topics include: Specification using entity-relationship model, relational database, database language SQL for definition, manipulation and querying, database design issues such as normalization, query processing and transaction management, storage management, architectures for databases and distributed databases. Special topics such as object-oriented databases, internet databases (Ex: Oracle 8i) and application server will also be discussed. A detailed tree diagram of the topics is enclosed. Concepts discussed will be supported by practical projects using unix-based Oracle DBMS, SQL and embedded SQL.

Class Meetings

Class	Instructor	Days	Time	Location
Lecture	Bina	MWF	9.00 – 9.50 pm	220 NSC
Recitation R1	xxxx	Fri	2:00 – 2:50am	263 Capen
Recitation R2	xxxx	Wed	10.00 – 10.50am	260 Capen
Recitation R3	xxxx	Thu	11.00 – 11.50 am	252 Capen
Recitation R4	xxxx	Wed	4.00 – 4.50 pm	112 Talbert

A tentative lecture schedule is enclosed.

Required Textbooks

1. *Database System Concepts*, by A. Siberschatz, H.K. Korth, S. Sudarshan, Third Edition, McGraw-Hill Companies Inc, 1999.

2. *Oracle 8 Programming: A Primer*, by R. Sunderraman, Addison Wesley Longman, Inc., 2000.

Prerequisites

1. CSE 305: Programming Language Concepts (co-requisite)
2. Working knowledge of C or C++ Java Programming Language.

Grading

Midterm Exam	100 points
Final Exam	200 points
Projects (3 - 100 points each)	300 points
Quiz, Lab, Homework (5 out of 6)	100 points
Attendance (2 for each lecture)	50 points

Final letter grades will be based on the (combined) overall percentage of all the items listed above. A (95 –), A- (90 – 94), B+ (85 – 89), B (80 – 84), B- (75 – 79), C+ (70 – 74), C (65 – 69), C- (60 – 64), D+ (55 – 59), D (50 – 54), F (less than 50). This policy is subject to change. If needed, the individual components and the overall grades will be appropriately curved.

Exams

The midterm exam will be held before the last date to **R**esign from the course. Final exam will be held during the regularly scheduled final exam week. Midterm exam will cover approximately 25% of the material and the final exam will be comprehensive. No make up exam will be given unless otherwise there is an extraordinary reason.

Quiz, Lab, Homework

Quizzes will be given during the lecture period or during the recitations. It will require about 10 minutes time. The questions will be from the material covered in the immediately preceding lectures. Homeworks usually involve paper and pencil work. These are to be submitted on-line even if there are math formulae involved. (So you better find a way of coding formulas into your text.) Lab work is also a type of homework but may involve programming and is usually assigned during recitation.

Projects

The due date for each project will be announced when it is assigned. All the source code, documentation, makefile, data files, and README files are to be submitted on-line. The details of how to submit given along with your first project. You will have to follow the rules for the other projects too.

Academic Dishonesty

There is no group work assigned in this course. You are required to work on your own. Students who collaborate on homework, projects and/or the exams will be penalized with an 'F' for that component of the course.

See http://www.cse.buffalo.edu/ shapiro/Courses/integrity.html for more details.

Attendance and Participation

It is very important that you attend all the lectures and the recitation. Two points for every lecture you attend is to encourage you not miss many lectures. (Observe that count only 25 of the possible 28 lectures) You are strongly encouraged to participate in the lecture by asking relevant questions and taking part in useful discussion. This helps break the monotony of the lecture format. But if I find a discussion digressing from the topic of the lecture I may defer the discussion to after the regular lecture period or to the newsgroup meant for this class. Understand that the newsgroup is a public forum and only class-related material is permitted for discussion in this particular newsgroup.

You are required attend both the lecture and recitation classes you are registered for. If you miss any of them it is your responsibility to find out what went on during the classes and to collect any material that were handed out.

Departmental guidelines for I-grade will be strictly followed: I-grade will not given because

- You are failing the course,
- If you drop/resign, you will loose full-time status,
- You may loose financial support,
- You will be put on probation,
- You are registered for 21 hours,
- You are working full-time,
- You are a graduate student,
- Other similar reasons.

For more details see http://www.cse.buffalo.edu/ shapiro/Courses/incompletes.html.

Important Dates
9/27 Project1 due
10/4 Exam1
11/1 Project 2 due
12/4 Project 3 due

TENTATIVE LECTURE SCHEDULE

DATES	TOPICS	MATERIAL
8/28	General Introduction; Goals; Expectations; Responsibilities; Basic concepts: Data models, relational database, query language (SQL), design issues	Ch.1
9/5	Entity-Relationalship (ER) model: entity, relationship, tables, diagrams, design	Ch.2
9/11	Relational Database : tables, tuples, relations, domain; relational algebra; design to tables	Ch.3
9/18	Structured Query Language (SQL): components DDL, DML, various structures, and operations	Ch.4
9/25	EXAM 1	Ch.1 to 4
10/2	Integrity Constraints : primary keys, functional dependencies	Ch.6
10/9	Database design concepts: normalizations, third normal form, theoretical basis for operations	Ch.7
10/16	Storage and file structures: storage hierarchy, file organization, indices; RAID	Ch.10
10/23	Indexing and hashing	Ch.11
10/30	Query processing: parsing, translation, optimization and evaluation	Ch.12
11/6	Object oriented databases, internet databases, Application servers	notes
11/13	Transactions; properties and management	Ch.13
11/27	Database architectural requirements; Issues in distributed database systems	
12/4	Review week	