C SCI 3287: Database Systems Concepts
Spring 2014, T-TH 3:30- 4:45pm, North 1408

Instructor: Debra C. Parcheta
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Meetings
T R - 03:30PM to 04:45PM at North 1408

Textbook:
Fundamentals of Database Systems, 6th Edition
Elmasri and Navathe
ISBN 0-321-36957-2
Reading should be done prior to the class in which the chapter will be covered (see schedule, below).

Catalog Data: Official Course Description DATABASE SYSTEM CONCEPTS
C SCI 3287. Database System Concepts. Introduces database design, database management systems, and the SQL standard database language. Includes data modeling techniques, conceptual database design, theory of object-relational and relational databases, relational algebra, relational calculus, normalization and database integrity.

Section Details - C SC 3287 - 001

Prereq: C SCI 2421.

Expected Knowledge/Skills when entering course
Students are expected to have mathematical, computer science and programming skills.

1. The expected mathematical skills include those taught in the CSC 2511 (Discrete Structures) course, as well as C SC 2421 (Data Structures and Program Design)
    a. Set operations and trees.
    b. Boolean logic
    c. Combinatorics and probability.
2. Expected programming skills include the following.
    a. basic problem solving techniques such as divide and conquer, top-down, bottom-up and object-oriented.
3. Basic computer science knowledge including the following.
    a. A basic understanding of abstract data types and algorithms.
    b. How to choose and use basic data structures, including linked-lists, vectors, heaps and search trees.

Expected knowledge upon leaving course.

- Database Systems Design Concepts
- Relational Database Design
- Exposure to SQL
- Ability to demonstrate use of formal models and languages used in Database Systems Design, Implementation and Documentation

Topics:

- Database Fundamentals
- Models – 3-schema Architecture, ER, EER
- Database Languages: Relational Notation, DBMS Languages, Relational Algebra, SQL Standard
- Variations in Database Design

Course Outline:

Date	Topic	Prior Reading	Assignments	Criteria a-m
1/21	Chapter 1: Databases and Database Users Also covered: Stonebraker's Model	Ch 1	Users and Interfaces Prereq form in to instructor Get a drawing program working. Homework 1	
1/23	Chapter 2: Database System Concepts and Architecture	Ch2	DB design and 3-schema architecture, n-Tiered architectures	
1/28	Unit 3: Data Modeling Using the Entity-Relationship Approach	Ch 7		a, k, l
1/30	Unit 3: Data Modeling Using the Entity-Relationship Approach	Ch 7	3 schema arch diagram due. ER Diagram HW will be issued.	a, l
2/4	Unit 3: Data Modeling Using the Entity-Relationship Approach:	Ch 7	Web meeting Q & A about ER diagram, no lecture, optional attendance	
2/6	No class – finish your ER diagram and turn in by due date.		ER diagram homework due by agreed date.	
2/11	Unit 4: EER and Object Modeling	Ch 8	EER diagram	a, k, l
2/13	Unit 4: EER and Object Modeling	Ch 8		
2/18	In class review - Chapters 1, 2, 7, 8	Ch 1, 2 7 and 8	EER diagram is due.	
2/20	test		Study for your test	
2/25	Unit 5: Record Storage and Primary File Organizations	Ch 17	Record Storage and File Organizations	a, k, l

2/27	Unit 6: Index Structures for Files	Ch 18		a, l
3/4	Unit 6: Index Structures for Files	Ch 18		a, l
3/6	Unit 6: Index Structures for Files	Ch 18	We will have a quiz to cover this chapter instead of drawing trees. Date will be announced in email.	a, l
3/11	Unit 7: The Relational Data Model and Relational Algebra	Ch 3, 6	Relational Calculus / Relational Algebra	a, l
3/13	Unit 8: SQL - A Relational Database Language	Ch 4		
3/18	Unit 8: SQL (cont) And Review Session	Ch 4	SQL Program 1	a, k, l
3/20	Midterm II		Take home	
3/24-30	Spring Break Week			
4/1	Unit 9: ER and EER-To-Relational Mapping	Ch 9	Relational Notation	a, l
4/3	Unit 10: Functional Dependencies and Normalization	Ch 15		a, k, l
4/8	Unit 10: Functional Dependencies and Normalization (cont)	Ch 15	FD and Normalization	
4/10	Unit 11: An Overview Of The Network Data Model (Legacy Systems)	Not in book	Depending on how we are doing with time, this lecture may or may not be presented.	
4/15	Unit 12: An Overview Of The Hierarchical Data Model	Appendix D		
4/17	Unit 13: Concepts For Object-Oriented Databases	Ch 11		
4/22	Unit 14: Distributed Databases	Ch 25		
4/24	Practical SQL		SQL Queries and DDL	a, d, l
4/29 – 5/1	Presentations		Demonstration and Presentation to the Class of your own Database Design	
5/6 – 5/8	Presentations		Demonstration and Presentation to the Class of your own	

			Database Design	
5/13	**Final Exam (may be scheduled for 5/10 instead – school will advise)**			
5/15				

Note: ***Each student must sign and return the Prerequisites Agreement form to receive any credit for any assignment or exam. If this form is not returned to Debra Parcheta by Monday of the 3rd week of class, the student will be administratively dropped from the course.***

Prerequisites are strictly enforced.

Grading Policy: If the Prerequisite Agreement form is turned in, the grading policy for the course will be as follows:

10% Quizzes
15% 1st Midterm Grade
15% 2nd Midterm Grade
25% Final Exam Grade
30% Homework Grades (includes practical db. implementation)

At the end of the semester, a cumulative score of 90 to 100 = A, 80 to 89 = B, 70 to 79 = C, 60 to 69 = D and lower than 60 earns an F. There is never a curve.

Other Requirements:

EMail
You are responsible for communicating your current email address at the university. You will have an opportunity on the first day of class to confirm the email that you use at CU. However, if there is any question about how to reach you, the information in your CU profile will be relied on.

Email is answered on a FIFO basis. Please keep in mind that I work full time and there are periods where I am out for several hours at a client site. I will try to answer emails within 24 hours (I usually do better than that).

Class Web Page:
None planned.

Lectures
Lectures will not be posted. Come to class prepared to take notes.

Drop boxes
If a need for a drop box comes up, I will tell you in class how/where to upload large documents.

Quizzes may be given at any time at the instructor's discretion and will include material from the book or the lecture or both. It is highly recommended that you have your reading done on the scheduled date for that unit.

Homework is due before class begins. Whenever possible, we will turn in homework by email. Make sure that your computer date and time is set correctly. No late assignments will be accepted and a zero will be given as the grade for missing assignments. NO EXCEPTIONS. Assignments are to be done individually. Collaboration is forbidden. On some assignments, there is more than one correct answer. Failure to do your own work or plagiarism can result in failure from this class. Homework may be assigned during every class and should be typed or computer generated. Make up assignments are not available as solutions are issued to all before we continue with next assignments.

Drawings
PC Users create drawings with Microsoft Visio.
All users – DIA
Mac Users – EasyDraw, Softonic

Or….all users may use other professional drawing programs that make the required shapes *and that allow you can convert the drawing to pdf format prior to sending it in. Using a drawing program that does not allow you to make the shapes shown in Chapter 7 of your text will cause you to lose points. No substitutions for the model shapes will be accepted.*

NOTE: Drawings done in Microsoft Word or Microsoft PowerPoint will receive an F grade. Word and PowerPoint are not drawing programs. Engineers use drawing programs. (You may INSERT a picture in Word document if that is appropriate on a small assignment.)

You will need to email your homework in a readable format. Emailing a document larger than 10 MB will result in 1 grade level being deducted from your score for that assignment. Using compression technology to reduce the size of a file is acceptable. Using pdf format is acceptable as long as the size is reduced. (Large files cause email problems that prevent everyone from sending in their work.)

Name your homework files so that there is no question that you are or what you are sending to me. For example, when I turn in homework assignment number 1, I will call the file dcparcheta_hw1.doc so that we know whom it belongs to and what it is. Also put your name in the body of your homework. Files that cannot be identified after downloading from email or printing them out will be given a zero grade and no opportunity will be given to change that grade. Files not named properly will also suffer a point downgrade to 0.

Cheating will not be tolerated in this class. Any student caught cheating on homework, quizzes or tests will be given an F for the course and the University will be informed in writing of your behavior. The policy on cheating for the Computer Science department is posted on the university web site.

DBMS accounts may be set up for all students for use after the second midterm and instructions with access information will be handed out. During the second half of this semester, you will be using SQL to work with tables containing data in some homework assignments.

Try not to divert the class from the subject matter. Many students have experience with one database program or another. It is tempting to "offer" resources to other students in your class based on what you know. Unfortunately, in past semesters, students have made recommendations to others that have diverted them from the skills being taught in this class. For example, UML is not taught in this class but some students, after following the recommendation of another student, became confused and used UML instead of ER concepts on their homework. Your grade depends

on you being able to demonstrate the skills and concepts taught in this course, not other "trendy" database topics or methods that your fellow students might get excited about. Other students have recommended particular DBMSs to download for free. Your grade depends on you implementing assignments using the DBMS installation at CU or at a server that I designate. GUI interfaces may or may not be used. (You won't need them because this course teaches you the SQL basics.) Data is on the designated server for your assignments, nowhere else. Please, do not engage in diversion or allow yourself to be sidetracked by other people leading you in the wrong direction.