Rensselaer

Course Syllabus

Course Information

Database Systems		CSCI 4380	Section 01
RPI Spring 2016	4 cr		
Lecture	MR	2:00PM-3:50PM	SAGE 3303

Course Website: http://www.cs.rpi.edu/~sibel/csci4380/spring2016/index.html
Piazza Discussion Forum: https://piazza.com/rpi/spring2016/csci4380

Prerequisites or Other Requirements: This is a fourth year computer science course. As a result, it assumes a level of academic maturity appropriate for a student in their junior or senior year. It also requires good working knowledge of data structures and algorithms, and proficiency in C++ programming or Python (equivalent of CSCI-2300).

Instructor

Professor Sibel Adali — sibel@cs.rpi.edu
Office Location: LALLY 313 — (518) 276-8047
Office Hours: W 4:00PM-6:00PM

Teaching Assistant(s)

Name	Office	Office Hours	Email Address
Young Liu	TBA	M 4PM-6PM, Th 5PM-7PM	liuy14@rpi.edu
Sidharth Sharma	TBA	T 10AM-12:00PM, Th 4PM-6PM	sharms5@rpi.edu

Course Description

This course provides an introduction to database systems, with a special emphasis on data modeling and programming. We will learn the fundamentals of database management systems and discuss how these fundamentals affect the best application design principles for databases. This course assumes no previous background in database systems. You will be expected to learn the use of computing systems on your own.

Course Text(s)

Database Systems: The Complete Book (2nd Edition), by Hector Garcia-Molina, Jeffrey D. Ullman, and Jennifer Widom. ISBN: 0131873253, Prentice Hall.

Course Goals / Objectives

Student Learning Outcomes

1. apply principles of normalization to design a data model that leads to the development of high performance data intensive applications
2. write correct and efficient code that implements application logic for high throughput data operations

3. apply understanding of the internals of database management systems to proper tuning of the data model, code and storage methods

Course Assessment Measures

Assessment	Due Date	Learning Outcomes
Homework	Every week	1, 2, 3
Exam	2 in-class exams in a semester, final exam during finals week	1, 2, 3
Quiz	Roughly every week	1, 2, 3

Grading Criteria

Quizzes (12%), Homeworks (38%), Midterms (15% each), Final Exam (20%).

To pass this course, you must get an average of 60 in your midterm and final exams regardless of your homework and quiz grades. This is a firm rule and will be determined by the weighted test average rounded to the nearest integer. Exceptions will not be made.

There will be regular in class quizzes. The expected frequency is once a week. Two of the lowest quiz grades will be dropped. The quizzes will count for 12% of your final grade. There will be homeworks roughly every week. The homeworks will count for 38% of your total grade. Some homeworks will be programming projects.

I will use the following chart to convert your year-end average to a letter grade (I reserve the right to lower these cutoff points, but I will never raise them):

	B+: 87-89	C+: 77-79	D+: 67-69
A: 93-100	B: 83-86	C: 73-76	D: 60-66
A-: 90-92	B-: 80-82	C-: 70-72	F: 0-59

Attendance Policy

You are not required to attend the classes, but you are responsible for knowing the topics covered and any announcements made in class and attend the quizzes. Missed quizzes cannot be made up even with a valid excuse. If you have an extended absence, talk to the professor.

Other Course Policies

You are responsible for all the information posted in this syllabus including the course policies as well as any announcements made in class or posted on Piazza. You must use Piazza for all course related questions.

You are expected to communicate to the instructor any issue regarding your performance in the class ahead of time. This includes absence from exams, late homeworks, inability to perform an assigned task, problems with your group members, the need for extra time on exams, etc. You should be prepared to provide sufficient proof of any circumstances on which you are making a special request as outlined in the Rensselaer Handbook of Student Rights and Responsibilities.

As part of the course material, you are expected to learn how to use a number of software products and frameworks. You will be given sufficient advance notice of such expectations and links to the appropriate study material. You are responsible for learning the software needed for the class.

Late Homework Policy: Late assignments create an extra burden on your TA and delay the discussion of the solutions in class. Homework assignments must be submitted electronically by the deadline, as measured by our computers. Assignments that are a minute late are considered a day late! Each student will be given a total of three days (whole or partial) of grace for late homework assignments for the whole semester. These grace days should be used carefully. Once the late days have been exhausted, late assignments will not be accepted without a written excuse from the Student Experience office. No more than 1 late may be used for a single homework.

Grade Appeal Policy: If you disagree with the grading on a homework, you should appeal to the TA first to maintain consistency in grading. If you are not satisfied with the outcome, then you should appeal to me. For exam grading, appeal directly to me. Appeals must be made within one week after the specific grade is returned.

Taking Exams: All exams will be open book and open notes. You may not use any electronic tools during exams including cell phones, tablets and calculators, and you may not share your notes with anybody during exams. If you will be absent from exams or have other circumstances requiring exceptions, you must get an official excuse from the Student Experience office (se@rpi.edu).

Academic Integrity

Student-teacher relationships are built on trust. For example, students must trust that teachers have made appropriate decisions about the structure and content of the courses they teach, and teachers must trust that the assignments that students turn in are their own. Acts that violate this trust undermine the educational process. The Rensselaer Handbook of Student Rights and Responsibilities defines various forms of Academic Dishonesty and you should make yourself familiar with these. In this class, all assignments that are turned in for a grade must represent the student's own work. In cases where help was received, or teamwork was allowed, a notation on the assignment should indicate your collaboration.

Cheating and Academic Dishonesty will not be tolerated. All your course work should provide an honest effort in solving the assigned problem by yourself (and by your group partners for group assignments). You are allowed to work with other students in designing algorithms, in interpreting error messages, in discussing strategies for finding bugs, but NOT in writing code or writing down solutions. Even if you discuss the problems with other students (or other teams), you should write down your own solution or program when turning in an assignment.

You may not share, copy, or discuss in detail code or solutions while writing it or afterwards. You may not show your code or solutions to other students as a means of helping them. You may not leave online, printed copies or drafts of your solutions in publicly accessible areas, such as labs, workstations, dorms, etc. You may not post complete or partial answers to homeworks in any public forum, especially on Piazza before the due date to make sure all students had a chance to work on the problems on their own.

All cases of cheating will be punished and reported to the Dean of Students. You will receive a grade of zero if you cheat on a homework. A second instance of cheating on a homework or any cheating in the exam will result in an F grade in this course.

If you have any question concerning this policy before submitting an assignment, please ask for clarification.

There may be changes to the policies, deadlines and list of topics described in the syllabus. You can expect me to give you reasonable notice of any changes. All changes will be announced in class.

Course Calendar

Session	Date	Topic	Readings
Week 1	Jan. 25, 2016	Introduction to Database Systems and Relational Data Model (2 classes)	Chapters 1, 2.1, 2.2
Week 1-2	Jan. 28, 2016	Data Modeling - Normalization (2 classes)	Chapter 2, 3
Week 3	Feb. 8, 2016	Entity Relationship Models (2 classes)	Chapter 3, 4
Week 3	Feb. 11, 2016	Catch up (1 class)	
Week 4	**Feb. 18, 2016**	**Exam #1**	
Week 5	Feb. 22, 2016	Algebraic Query Languages (1 class)	Chapter 5
Week 5-6	Feb. 25, 2016	SQL Language (3 classes)	Chapter 6
Week 7	Mar. 3, 2016	Constraints and Triggers (1 class)	Chapter 7
Week 7	Mar. 7, 2016	Views and Indexes (1 class)	Chapter 8
Week 8	Mar. 21, 2016	SQL in a server environment (2 lectures)	Course notes, Chapter 9
Week 9	Mar. 28, 2016	Catch up (1 class)	
Week 9	**Mar. 31, 2016**	**Exam #2**	
Week 10	Apr. 4, 2016	Secondary Storage Management (1 class)	Chapter 13
Week 10	Apr. 7, 2016	Index Structures (2 classes)	Chapter 14
Week 11	Apr. 14, 2016	Query Execution (2 classes)	Chapter 15
Week 12	Apr. 21, 2016	Query Compiler (2 classes)	Chapter 16
Week 13-14	Apr. 28, 2016	Transaction Management (3 classes)	Chapters 17, 18, 19
Week 15	May 9, 2013	Catch up (1 class)	
Finals Week		**Final Exam**	