Hunter College, City University of New York
Computer Science Department
Course Syllabus
CSCI 232: Relational Databases and SQL

Instructor	Room	Meeting Time	Email/contact
Raman Kannan	Blackboard collaborate	TTH 5:35 - 6:50 pm	Rk2218@hunter.cuny.edu 646-244-4943
Office Hours:		TTH 4-5 PM by appointment	

Course Description

This course is a clinical introduction to relational databases, their application in bioinformatics and other domains. Students learn how to write SQL queries, the focus of this course is an introduction to databases for quantitative biology. It is intended for students in the Quantitative Biology program and computer science minors. It does not offer credit to the computer science major.
SQL is a declarative-ANSI Standard language to retrieve data from relational database. For large, pre-existing databases without customized interfaces (including many under development by biologists here at Hunter), SQL is either the standard access language or a more flexible and incisive alternative. The primary objective of this course is to enable you, working from the command line of an SQL interpreter, to extract and reformulate data from large relational databases. Your goal is to produce readable, useful output from large collections of data. Although we will often work with biological data, the fundamental principles you will learn can be applied in any database environment that supports SQL.

Course Objectives

After completing the course, the students should be conversant in both DDL and DML of ANSI Standard SQL database. Students are expected to:

- Understand the business requirements and create tables database given datasets.
- create and modify relational schema to solve assigned problems.
- write ANSI Standard SQL queries to retrieve data from any relational database using set theoretic formulation.
- Maintain the database (insert, update, delete, and retrieve data).

Textbooks

- The textbook for this course is **Oracle SQL by Example** fourth edition published by Prentice Hall in 2009 with ISBN 978-0-13-714283-5.

• Another textbook is recommended: **Learning SQL**, second edition by Alan Beaulieu, published by O'Reilly in 2009, by Alice Rischert, with ISBN 978-0-596-52083-0.
Text books are suggested NOT required. Instructor will post lecture material on blackboard. Students are expected to review them on their own. In the class Instructor and students will work through SQL and Relational Database mechanics. Instructor may change the order in which topics and the scope are developed, during the semester.

Software

All programming in this course requires SQL and R scripting. In Computer Science Department we use **Oracle SQL Plus** which compiles with SQL:1999 standards. However students can also use any ANSI compliant relational database including mariadb, mysql, postgres, Oracle SQL Plus, or Microsoft SQL Server. Oracle tools can be downloaded free for Hunter Students at http://www.oracle.com/technetwork/database/enterpriseedition/downloads/index.html
You can install it on your own computer, available for free called MySQL Community Server as 5.1.61 at http://www.mysql.com/downloads/mysql/5.1.html#downloads Excellent documentation on MySQL is available at http://dev.mysql.com/doc/refman/5.1/en/index.html. We are not particular about version. Read it as 5.1.61 or higher.

Grading and homework

Course grades are based on 3 homework, 3 month end quiz, two exams, a midterm and a finals
Class participation 12% (12 out of 14 sessions attendance is required)
Homework 18% (minimum 3 homeworks)
Month End quiz (3) 30%
Midterm exam 20% (approximately at the end of 8th week)
Final exam 20% (at the end of 14 weeks)
Homework problems are due at the time specified in the assignment description; you can submit it electronically or hand it in class. All homework should be individual work. A penalty of late homework and projects will be applied as follows:

- 0 to 24 hours late: 25% penalty
- 24 to 48 hours late: 50% penalty
- More than 48 hours late: no credit will be given.

CUNY/Hunter Fall Schedule

No Class 09/29 Hunter follows Monday Schedule – is a TUE – please make a note.
No Class 10/14 Hunter follows Monday Schedule 10/14 is a WED – does not affect us.

Course outline

The schedule here may evolve as the semester progresses. Assignments will be posted regularly on Blackboard.

	Topic	*Source*
	Introduction to databases	
	Relational Database	Chapter 1
	Tables, Records,Columns, Attribute,Type,Domain	
	Lifecycle: CRUD	
	Basic queries	Chapter 3
	Basic queries Group/aggregate	Chapter 6
	Basic queries Subqueries	Chapter 8
	Querying multiple tables Joins	Chapter 7
	Querying multiple tables Joins	Chapter 7
	Querying multiple tables Joins	Chapter 7
	Querying multiple tables Union	Chapter 7
	Working with sets	Chapter 9
	Working with sets	Chapter 9
	Working with date	Chapter 4,5
	Grouping and aggregates	Chapter 6
	Grouping and aggregates	Chapter 6
	Midterm	
	Regular Expressions	Chapter 16
	More on sub queries	Chapter 8
	More on joins	Chapter 10
	More on joins	Chapter 10
	Case and control	Chapter 16
	Case and control	Chapter 16
	Genetics & Databases Sequencing/Searching Genetic DB	
	Techniques and Useful patterns	
	Final Review	
	Final Exam	

Anyone violating academic integrity will be sent to the Office of the Dean of Students. Additional information and definitions can be found at
http://www.hunter.cuny.edu/studentservices/advising/policies-sub/proceduresforreporting-academic-integrity-violations