

CSCC43 Introduction to Databases

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Virtual Office Hours: Tuesday 11:00 am to 12:00 pm

All course Information is available on **Quercus**

Course Description

The purpose of this course is to help students become fluent users of database technology and languages. Topics include:

- The relational data model.

- Relational algebra.

- Querying and updating databases: the query language SQL.

- Application programming with SQL.

- Integrity constraints, normal forms, and database design.

- Elements of database system technology: query processing, transaction management.

- XML and other forms of non-SQL data management.

Prerequisite CSCB09H3 and CSCB63H3

Exclusion CSC343H

Motivation

Databases are incredibly ubiquitous and underlie technology used by most people every day. Databases reside behind a huge fraction of websites; and they are a crucial component of telecommunications systems, banking systems, video games, and just about any other software system or electronic device that maintains some amount of persistent information. In addition to persistence, database systems provide several other properties that make them exceptionally useful and convenient: reliability, efficiency, scalability, concurrency control, data abstractions, and high-level query languages.

Course Learning Outcomes:

Upon completion of this course, students will be able to do the following:

1. Learn the basic concepts and appreciate the applications of database systems.
2. Be familiar with the relational database theory and be able to write relational algebra.
2. Master the basics of SQL and construct queries using SQL.
3. Be familiar with a commercial relational database system PostgreSQL by writing SQL expressions for queries.

5. Master sound design principles for logical design of databases, including the E-R method and normalization approach.
7. Learn the basics of query evaluation techniques and query optimization.
8. Be familiar with the basic issues of transaction processing and concurrency control.

Lectures:

Each week Instructor and students will meet for a live lecture session on zoom. Each lecture will be recorded for students and will be posted online (Quercus) for reference.

Labs/Tutorials:

There are weekly labs conducted online (Starting in Week 2).

Tentative Schedule

Topics covered in the course:

Note: The Schedule given below is tentative and subject to change:

Weeks	Topics
<i>Week 1</i>	Introduction – Databases, Relational Model
<i>Week 2</i>	Relational Model, Relational Algebra
<i>Week 3</i>	Relational Algebra Queries
<i>Week 4</i>	SQL Query Language
<i>Week 5</i>	Advanced SQL
<i>Week 6</i>	Non-interactive SQL
<i>Week 7</i>	SQL Security
<i>Week 8</i>	Mid-term Exam
<i>Week 9</i>	ER model
<i>Week 10</i>	Database Transactions
<i>Week 11</i>	NOSQL – Semi-structured Data XML
<i>Week 12</i>	Wrap-Up

Textbooks or readings

Database System Concepts, Sixth Edition Avi Silberschatz, Henry F. Korth, S. Sudarshan

McGraw-Hill
ISBN 0-07-352332-1

Database Systems, Second Edition
Hector Garcia-Molina; Jeffrey D. Ullman; Jennifer Widom
ISBN: 0131873253

Course work and grading

Throughout the course, there will be three assignments, one mid-term and final exam.

For course evaluations for each of the course work, please refer to the table below:

	Weight	Comment
3 Assignments	Total 30%	
<i>Breakdown:</i>		
Assignment 1	8%	Due 6 th June
Assignment 2	10%	Due 19 th June
Assignment 3	12 %	Due 18 th July
Mid Term	30%	Will be held during Lecture time. June 28 th Monday
Final Exam	40%	

Assignment: Based on the content of 2-3 weeks, exercise will be posted on Quercus.

Mid Term: The test will be during class time (120 min)

Final Exam: There will be one final exam for the course. You need to score at least 35% in finals to pass the course.

Note: Please know that Assignments due dates are flexible and might be changed during course

Course policies

expectations for participation and attendance

You need to attend all the lectures and labs.

Deadlines for assignment submissions

Assignments are required to be submitted electronically.

Extensions or penalties for late work

Submit your work on time. Your work will be penalized by 10% for each day of the late submission unless valid reason for the late submission is provided.

Remark Requests

Remarking requests will be accepted up to 48 hours after grading.

academic integrity / plagiarism

All the work you submit must be your own and your work must not be submitted by someone else. Plagiarism is academic fraud and is taken seriously. The department uses software that compares programs for evidence of similar code. Please read the Rules and Regulations from the U of T Calendar (especially the Code of Behavior on Academic Matters).

Please do not cheat. It is unpleasant for everyone involved, including us. Here are a couple of general guidelines to help you avoid plagiarism:

- Never look at another student's assignment solution, whether it is on paper or on the computer screen.
- Never show another student your assignment solution. This applies to all drafts of a solution and to incomplete solutions.
- The easiest way to avoid plagiarism is to only discuss the assignment with the CSCC43 TA, and your instructor.

Getting Help:

Besides attending lectures, there are several ways to get help:

- Labs: Labs are a great way for you to get some hands-on practice at programming. Your TA will be a SQL expert – you should feel free to ask him/her questions during the lab. You will not only get practice by doing the labs, but you will also get marked on them.
- Office Hours: Stop by (virtual) office hours to ask questions or to hear questions asked by other students. This is a great way to learn.
- Email: As a last resort, feel free to email me. Please try to email me more than 24 hours in advance of a deadline; I make no promises that I will answer assignment-related emails within 24 hours of a deadline.

If you are having trouble with the course material or if you need extra help, please do not hesitate to contact me. I will answer as soon as possible. Keep in mind that the closer to an assignment due date that you send an email, the longer you wait for a reply is likely to be, due to the large quantity of messages that I receive. Also, please follow these guidelines for email correspondence:

1. Please read the announcements on the course website to see if your question has already been answered before sending me email.

2. Include a good subject. At the very least, include the course number in the subject of the email, and use a good topic (for example, "CSCC43: A1 question about Relational Algebra").
3. Sign your full name to the email.

Remote/Online Courses – Instructor Recording

This course, including your participation, will be recorded on video and will be available to students in the course for viewing remotely and after each session.

Course videos and materials belong to your instructor, the University, and/or other source depending on the specific facts of each situation and are protected by copyright. In this course, you are permitted to download session videos and materials for your own academic use, but you should not copy, share, or use them for any other purpose without the explicit permission of the instructor.

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On Equity, Diversity, and Inclusion

The University of Toronto is committed to equity, human rights, and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. U of T does not condone discrimination or harassment against any persons or communities.

On Accommodation

The University provides academic accommodations for students with disabilities in accordance with the terms of the Ontario Human Rights Code. This occurs through a collaborative process that acknowledges a collective obligation to develop an accessible learning environment that both meets the needs of students and preserves the essential academic requirements of the University's courses and programs. Students with diverse learning styles and needs are welcome in this course. If you have a disability that may require accommodations, please feel free to approach me and/or the [Accessibility Services](#) office.