CSCB20 Introduction to Databases and Web Applications -- Winter 2025

Course Description

The purpose of this course is to give students a practical introduction to databases and Web app development. Topics we will study in this course include:

- Databases:
  - Key terminology and real-world applications
  - Creating, querying, and updating databases
  - Designing databases using the entity-relationship model
- Web documents and applications:
  - Developing static and interactive web documents
  - Setting up web servers and generating dynamic server-side content
  - Integrating web applications with databases for seamless functionality

Course Administration

Instructor	email	Office hours	Lecture Day and Time
Purva Gawde	purva.gawde@utoronto.ca	**Location:** **IA 4056** Monday 11:00 to 12:00	Friday 9:00 to 11:00

Lectures in-person will not be recorded.

All course Information is available on **Quercus**

Required Background

Some experience with programming in an imperative language such as Python, Java, or C. You may not take this course after - or concurrently with - any C- or D-level CSC course.

Exclusion This course may not be taken after - or concurrently with - any C- or D-level CSC course.

Motivation

Databases are incredibly ubiquitous and underlie technology used by most people every day. Databases reside behind a huge fraction of websites. Most of the amenities we enjoy on the Web are provided by web database applications. Web-based email, forums and bulletin boards, online shopping, corporate web sites, and sports and news portals are all database-driven. To build a modern web site, you need to develop a database application. In this course, you will learn how to bring together Web and databases to build applications.

Course Learning Outcomes:

Upon completion of this course, and of course with hard work and practice, you will:

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.
3. Master the basics of SQL and construct queries using SQL.
4. Comprehend the fundamentals of web application development by building database backend app from scratch, using HTML, JavaScript, micro web frameworks like Python Flask, and other open-source tools.

Labs/Tutorials:

There are weekly tutorials conducted in person.

Tentative Schedule

Topics covered in the course:
****Note**: The Schedule given below is tentative and subject to change:

Weeks	Topics
Week 0	Introduction – Databases, Relational Model
Week 1	Relational Model, Relational Algebra
Week 2	Relational Algebra Queries and SQL Query Language
Week 3	SQL Query Language
Week 4	SQL and Introduction to web development
Week 5	Introduction to HTML and CSS
	Mid-term Exam
Week 6	HTML, CSS, Box Model
Week 7	Introduction to Flask, Flexbox and Media Queries
Week 8	Flask and Introduction to JavaScript
Week 9	Integrating Flask and SQL

Week 10	Flask and SQL, examples
Week 11	Wrap-up

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 **Breakdown:** **Assignment 1** **Assignment 2** **Assignment 3**	Total 33% 8% 10% 15%	
Term Test	25%	Will be held in-person during Lecture time. Tentatively: February 24th
Tutorial attendance	2%	Tutorials will not be submitted or marked. Attend at least 7 tutorials.
Final Exam	40%	Need to score at least 35% to pass

- Assignment: Based on the content of 2-3 weeks, exercise will be posted on Quercus.
- Tutorials:
    - Tutorials will include collaborative problem-solving and practical demonstration of various concepts taught in class. Problems solved by you during these tutorials will not be marked. However, attending tutorials will fetch 2% marks. Submit valid reasons for not attending tutorials.
    - TA will pass around a sheet, where you will record the last four digits of student ID number. You need not write your name or ID on the sheet for privacy/confidentiality reasons.
- Mid Term: The test will be in-person during class time (120 min)
- Final Exam: There will be one in-person 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 and term test date are flexible and might be changed during course

Textbooks or readings

For a course like this, no single textbook will represent the course expectations well.

However, we will provide you weekly reading material (some of which will be mandatory) from other universities and other places on the web. This material will supplement well with what is taught in the class.

Course policies

Expectations for participation and attendance

You need to attend all the lectures and tutorials. If student is not able to attend the tutorials, then please provide valid reasons for your absence.

Instructions for assignment submissions

- There are three assignments. You may be asked to work in pairs on some of these assignments. Please check the assignment handout for more details on whether working in pairs is permitted or not; other details such as the exact due date will also be mentioned on the assignment handout. DO NOT EMAIL YOUR ASSIGNMENT SUBMISSIONS TO US. We will use MARKUS for the submission of all assignments. A STRICT silent policy takes effect 12 hours before an ASSIGNMENT or EXAM is due. This means that the teaching staff will answer no questions about the assignment.
- We will follow the due dates mentioned in the course syllabus. However, if the due dates on the assignment handout differ from this course syllabus handout, the assignment handout's due dates will supersede.

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.
- Late submissions with 10% penalty for each day will be accepted until day 3 (72 hours) past the original submission deadline. ***Later submissions will not be graded unless valid reason for the late submission is provided***.

Remark Requests

- If a piece of work has been mismarked or if you believe the rubric used to evaluate the work is not appropriate, you may request a remark. For a re-mark to succeed, you must clearly and concisely express what you believe was mis-marked or unfairly marked. To request a remark, set up an appointment with the instructor and the TA that has marked your assignment/exam.
- PLEASE DO NOT USE THE DISCUSSION BOARD REQUESTING FOR REMARKS.
- Be prepared for the entire work to be re-evaluated and for the mark to be adjusted up or down after the re-evaluation. Remark requests MUST be made 48 hours after the mark is made available. No remark request will be accepted after 48 hours.

Working with a Partner:

- For *some* of the assignments, you have the option of working in group of two or three and we encourage you to do so. Each group may contain up to a maximum of 3 people including yourself from your own section. You may choose your own partners and it does not need be the same person for each assignment. Once you begin working on

an assignment, you may not dissolve your partnership without my permission. All team members will receive the same mark.

- Some assignments may require group of two while other assignments might require group of 3. Details will be mentioned in each Assignment handout.
- Working with a partner has the potential to lighten your workload or to increase it, depending on how well you work together. Remember that you are responsible for learning the course material underlying all parts of the assignments. You will have the most success if you truly work together.

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 CSCB20 TA, and your instructor.
- Getting any component of the solution (including a verbal step-by-step explanation of how to do it) from another student, social-networking apps e.g. WeChat, Discord or 'Mentoring' services, etc. is an academic offense.
- Read the following handout for tips on how to stay out of trouble:
    - https://www.utsc.utoronto.ca/aacc/sites/utsc.utoronto.ca.aacc/files/tipsheets/AIM%20-%20Tipsheet%20oct%202015.pdf

Getting Help:

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

- Piazza: The purpose of the forum is to provide a place for students to discuss material and help each other with assistance and supervision from the TAs and course instructors. It is *not* a substitute for office hours, tutorials, or lectures. It is unreasonable to expect the TAs or instructors to continually hover over the forum just so that questions can be answered within minutes.
  Do not expect this. Do not post solutions to the forum – this includes assignments, tutorials. Helping each other is good, giving away solutions is not. Everyone in the forum is expected to behave professionally and with courtesy. The forum is not a place for venting frustration. It is a professional environment, and everyone will treat it in that way. Anyone caught behaving unprofessionally will have their access revoked.
- Tutorials: Tutorials are a great way for you to get some hands-on practice at programming.
  Your TA will be a Database language (SQL) and web app related languages (Python, HTML, CSS, JavaScript) expert – you should feel free to ask him/her

questions during the tutorial. You will get required practice for solving assignment questions by doing the labs.

- Office Hours: Stop by 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, "CSCB20: A1 question about Relational Algebra").
  3. Sign your full name to the email.

Copyright in Instructional Settings

If a student wishes to tape-record, photograph, video-record or otherwise reproduce lecture presentations, course notes or other similar materials provided by instructors, he or she must obtain the instructor's written consent beforehand. Otherwise, all such reproduction is an infringement of copyright and is absolutely prohibited. In the case of private use by students with disabilities, the instructor's consent will not be unreasonably withheld. For more information on copyright and the University of Toronto, please visit the copyright page.

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.