



CSC309H1: Programming on the Web

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Course Description

An introduction to software development on the web. Concepts underlying the development of programs that operate on the web; survey of technological alternatives; greater depth on some technologies. Operational concepts of the internet and the web, static client content, dynamic client content, dynamically served content, n-tiered architectures, web development processes, and security on the web.

Link to the Academic Calendar: <https://artsci.calendar.utoronto.ca/course/csc309h1>

Prerequisites

- Programming experience & Python (CSC108)
- Advanced programming & OOP (CSC207 & CSC148)
- Basic shell & system programming (CSC209)
- Corequisite : Database systems (CSC343). Note that this is not strictly enforced, but highly recommended.

This course is suitable for anyone interested in learning web programming and may be seeking a relevant job in the future. It assumes no prior knowledge or experience in web development. So everything will be discussed from the very basics.

Learning Objectives

At the end of the course, you will:

- Explain the structure of the web and how HTTP works
- Create web pages with HTML, CSS, and JavaScript
- Build interactive frontend applications with React and React Router.
- Build backend applications using Express.js, and design and implement RESTful APIs.
- Work with Prisma ORM to store, retrieve, and manage data, and implement authentication using JWT.
- Identify and prevent common web security issues
- Follow best practices in web development to deploy full-stack web applications

Course Contact Information

Course email address: csc309-2025-09@cs.toronto.edu

Instructor: Pan Chen

Lab coordinator: Sophia Huynh

Instructional support: Cindy Tran

Please use email for personal issues and Piazza for all other course-related questions. We will try to respond to email by the end of the next day. However, due to volume, it may take longer, especially on weekends.

Lecture & Tutorial Schedule

Section	Lecture Time and Location	Tutorial Time and Location
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LEC 2501 & LEC 5201	Thursday 5:00 PM - 7:00 PM	Thursday 7:00 PM - 8:00 PM
	BA 1160	BA 3175, BA 3185, BA 3195
LEC 5101	Tuesday 5:00 PM - 7:00 PM	Tuesday 7:00 PM - 8:00 PM
	SF 1101	BA 3175, BA 3185, BA 3195

In the lectures, we will cover core material of the course. During the lectures, you may be asked to participate through in-class activities and exercises. Thursday's lectures will be recorded and posted by the end of Friday for short-term review (available for two weeks). **These recordings are provided only as a supplement to your learning, not as a replacement for attendance. You are strongly encouraged to attend lectures in person**, since participation, in-class activities, and real-time interaction with the instructor and peers are essential to mastering the material and completing the exercises effectively.

The purpose of the tutorials is to provide hands-on practice of related tools and frameworks and reinforce lecture materials by guiding students through examples and exercises of key web programming concepts.

Office Hours

Instructor holds regular office hours based on the following schedule. TAs will hold office hours depending on TAs' availability and students' needs. Full office hours information can be found on the course calendar.

Note: Office hour information will be updated every Monday.

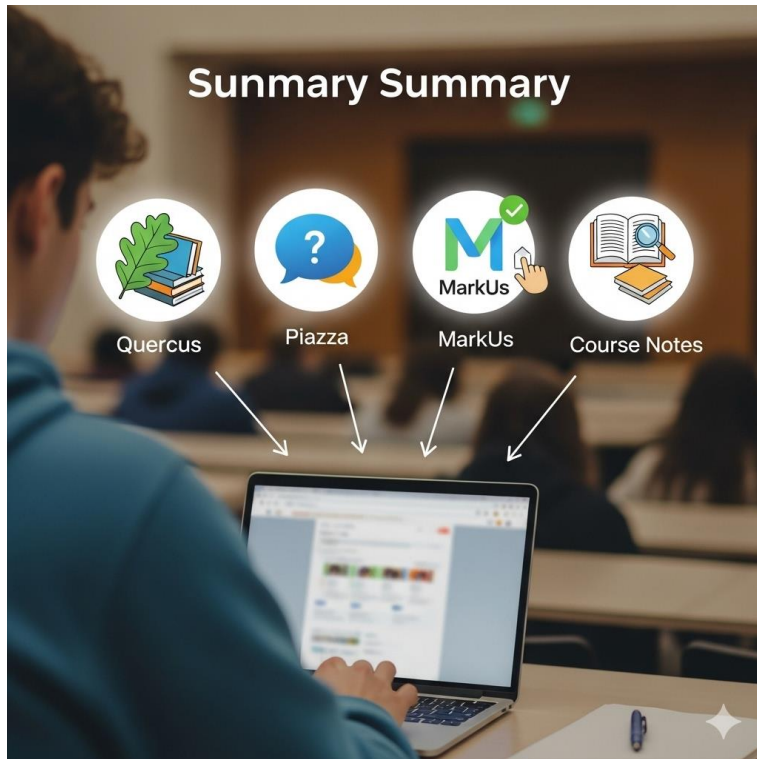
Textbook(s)

There are no textbooks for this course. You can Google related keywords to find reference manuals on each major topic. Midterm and final exam material will solely be sourced from the lecture notes and tutorial content.

Websites

We are using the following websites for this course:

- **Quercus:** where you will find the links to all course materials, and this is where you do the in-class exercises. While contents may not directly be on Quercus, you can find the links to them here.
- **Piazza:** This term we will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, the TA, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. If you have any problems or feedback for the developers, email team@piazza.com.
 - Find our class signup link at:
<https://piazza.com/utoronto.ca/fall2025/csc309>
- **MarkUs:** for some assignments or tutorial exercises, you may be asked to submit your work to MarkUs.
- **GitHub:** We will be using GitHub to share some code, usually the in-lecture starter code.
- **OneDrive:** we will save some course materials, in particular, the slides in OneDrive.
- **Course Notes:** throughout the term we will be developing a course notes website. Although it is named as a “Course Notes” website, they are more for optional reading or supplementary to the lecture materials.
- **Mentimeter:** we may use mentimeter during the lectures for non-credit activities



Course Calendar

We will be using Outlook Calendar for this course. You are recommended to subscribe to it and enable alerts. You can also check this Quercus page to access the Calendar.

Marking Scheme

Overview

ITEM	WEIGHT
In-Lecture Exercises (best 10)	1% (0.1% each)
10 Tutorials Exercises	20% total (2% each)
Assignment 1	5%

Assignment 2: 10%	10%
Term Project	19%
Midterm Test	15%
Final Exam	30%

Detailed Description

Lecture Exercises (1%)

There will be in-class exercises associated with the lectures during most classes. These will typically take the form of quizzes on Quercus. We will take the best $n - 2$ out of n scores. We expect that n will be 12 so that each completed lecture exercise is worth 0.1%. We strongly encourage you to do these exercises in class to get a clearer understanding of the material. We welcome questions about these activities during the synchronous lectures.

All lecture exercises for the week will be due on the following Monday at noon (12:00:00PM)

Tutorial Exercises (20%)

For each tutorial, you will be asked to turn in a small piece of work or to work on an activity during the tutorial. These exercises will be auto-graded and should be completed individually. Where possible, you will be allowed to resubmit and we will take your final score. Many of these will be directly related to the assignments. We will take the best 10 out of 11 scores (2% each).

All tutorials exercise for the week will be due on the following Monday at noon (12:00:00PM)

Programming Assignments (15%)

Over the term, you will complete 2 assignments that consist of problems that challenge your understanding of the concepts and will be auto-graded.

Assignment 1 (5%)

Assignment 1 is a solo assignment, which means that you must complete the work by yourself.


Assignment 2 (10%)

For assignment 2, you may work with other students only if they are your team members for the term project. Everyone must submit the work individually.

Term Project (19%)

The project simulates a real-world website that you are likely to develop in the future as a freelance web developer. Even though the scope is considerably small, it is designed to give a sense about how creating a real website and being a full-stack developer would look like. For the project, you can make groups of up to 4 members. You could also do it alone, but it is not recommended as the workload might be excessive for one person.

The project will be based on the RESTful APIs that you developed during assignment 2. After the project deadline, your final deliverable will be graded through an interview with a TA during which they work with your website to check if the requirements are implemented correctly (interview booking link TBA). In normal circumstances, every member will receive an identical grade. However, if you run into situations where some members are not contributing fairly to the project, you should contact the instructor via course email about the issue.

-  We will send out peer feedback forms during the projects development where you may give your team members actionable feedback.

Midterm Test (15%)

There will be one 55-minute test, which should be completed during your regular lecture time slot. Midterm coverage will be the course content taught prior to reading week. The midterm test format will be **in person**. The exact details of the midterm format will be

released one week before the start of the reading week. And the midterm test will tentatively happen during Week 7 (Oct 14 or Oct 16).

If you cannot write the Midterm test due to extraordinary circumstances beyond your control, please make a special request. Special consideration requests will be evaluated on a case-by-case basis.

Final Exam (30%)

The Final Exam is scheduled by Arts & Sciences and the exact date and time will be released later. It will cover all course material, including topics that were tested on the midterm test and questions about the tutorials and assignments. The final exam format will be **in person**.

Policies and Statements

Auto fail policy

To pass the course, a student must get at least 40% on the final exam, after all applicable adjustments. Otherwise, the student's grade won't be higher than 47%.

Minimum Standards for Submitted Work

For your tutorial work or assignment to be graded, it must meet the minimum standards of a professional computer scientist. All required files must be submitted. If the submission contains a web page, it should work on either Firefox 140.2.0 ESR or Google Chrome 139.0.7258.154/155. If the submission needs to run on Node.js, it should work on v22.12.0 LTS. Last-minute difficulties with git can easily be avoided by ensuring all files are added to the repository well before the deadline, and that you know how to commit and push them.

Submissions that are missing files or do not run correctly will receive a grade of 0.

ESR: Firefox Extended Support Release

LTS: Long-Term Support

Due Dates and Late Work

Due Dates

All deliverables will be due sharply at 12:00:00 PM (noon) on a specified date. For example:

- All in-lecture exercises will be due sharply at 12:00:00 PM (noon) on the following Monday.
- All tutorial exercises will be due sharply also at 12:00:00 PM (noon) on the following Monday.

Please note that a submission made at 12:00:01 p.m. after the due date will be considered late. You should ensure that your work is not submitted at the very last second. Since you will be using version control, it is very easy to commit regularly to avoid running into the deadline.

Please note that there are no grace tokens or automatic extensions of any kind. Late submissions will not be accepted unless under exceptional circumstances. If you find yourself in a serious medical or emergency or for any valid reasons such as religious holidays, family events, etc., you can make a special request to explain your circumstances and your specific special consideration request. Special consideration requests will be evaluated and accommodated on a case-by-case basis.

Special Request Form

We will be using a Microsoft Form to process special requests related to graded deliverables. You will be asked to provide your name and UofT email address, and in some cases, other relevant information depending on the nature of your request. All information collected will be kept confidential and deleted once the course concludes. If you are uncomfortable sharing information online, you are encouraged to come to the instructor's office hours to discuss your request in person.

We will try our best to respond to your special request within 4 business days. It is your responsibility to submit a special request at least 7 days prior to the deliverable's deadline.

We may not process special requests submitted less than 7 days before the deadline, unless it is an emergency.

Specific Medical Circumstances

In the event of an illness or other catastrophe that affects your ability to do your academic work, consult the course instructors right away. Normally, you will be asked for

documentation in support of your specific circumstances. This documentation may take the following forms:

- Absence declaration via [ACORN](#)
 - The University has updated its policies on the use of the Absence Declaration, which can now only be used in case of (a) a health condition or personal injury, (b) a personal or family emergency, or (c) bereavement. Students may submit one absence declaration per academic term, to declare an absence for a maximum period of seven consecutive calendar days. The seven-day declaration period can be retroactive for up to six days in the past, or up to six days in the future, but it must cover the period in which the missed academic obligation occurred.
- [U of T Verification of Illness or Injury Form \(VOI\)](#)
 - The VOI indicates the impact and severity of the illness, while protecting your privacy about the details of the nature of the illness. If you cannot submit a VOI due to limits on terms of use, you can submit a different form (like a letter from a doctor), as long as it is an original document, and it contains the same information as the VOI (including dates, academic impact, practitioner's signature, phone and registration number). To download a copy of the VOI, please see <http://www.illnessverification.utoronto.ca>.
- College Registrar's letter
- Letter of Academic Accommodation from Accessibility Services

For more information on documentation of absences for Arts and Science students, including limitations on the use of the Absence Declaration tool, refer to the [A&S Student Absences](#) page. It is always easier to make alternate arrangements before a due date, so please inform us as soon as you know that you will need accommodation. If you get a concussion, break your hand, or suffer some other acute injury, you should register with Accessibility Services as soon as possible.

Remark Requests

If you believe there was an error in the grading of your tutorial work or assignment, you may submit a remark request through MarkUs. Your request must clearly state one of the following:

- Marking error: Clearly and concisely describe the specific error you believe occurred in the grading.

- Minor submission issue: Identify a minor problem in your submission that can be resolved with no more than one line of code, e.g., so that your code would compile again. If your request is accepted under this category, a 20% penalty will be applied.

Remark requests must be submitted within one week of the marks being released. Please note that remarking may result in an increased grade, no change, or a decreased grade.

Academic Integrity

All of the work you submit must be done by you and your work must not be submitted by someone else. Plagiarism is academic fraud and is taken very seriously. The department uses software that compares programs for evidence of similar code. Please refer to the UofT [Academic Integrity website](#) and read the [Code of Behaviour on Academic Matters](#)). Here are a few guidelines to help you avoid plagiarism:

Honesty and fairness are fundamental to the University of Toronto's mission. Plagiarism is a form of academic fraud and is treated very seriously. Please refer to the University of Toronto [Academic Integrity website](#) and read the [Code of Behaviour on Academic Matters](#). Here are a few guidelines to help you avoid plagiarism.

Assignments

Assignments are to be completed individually: you must work independently on Assignment 1, and only with your designated project teammates on Assignment 2. Collaboration outside of these guidelines, including sharing or copying code from peers or external sources such as open-source repositories, is strictly prohibited.

You are welcome to consult online references, tutorials, and Q&A sites to support your learning. However, all code you submit must be written by you (or, in the case of Assignment 2, by your project team). Submitting work that is not your own will be considered academic misconduct and will result in disciplinary action under University regulations.

If you choose to use generative artificial intelligence tools, you must follow the specific course policy on AI usage outlined in this syllabus.

Project

For the project, you are permitted to use open-source packages and code available on the internet. However, sharing any part of your code with other teams, or using code shared by other teams, is strictly forbidden. If you use online code, it must be properly referenced, including a citation of the webpage from which it was sourced. Violations of this rule will be treated as serious breaches of academic integrity.

Tests

No aid is allowed during the midterm test and the final exam.

Course Policy on Artificial Intelligence

In this course, you may use generative artificial intelligence (AI) tools, including ChatGPT, Microsoft Copilot, and GitHub Copilot, as learning aids and to help complete assignments. You will not be permitted to use generative AI on the midterm test or final exam. While some generative AI tools are currently available for free in Canada, please be warned that these tools have not been vetted by the University of Toronto and might not meet University guidelines or requirements for privacy, intellectual property, security, accessibility, and records retention. Generative AI may produce content which is incorrect or misleading, or inconsistent with the expectations of this course. These tools may even provide citations to sources that don't exist—and submitting work with false citations is an academic offense. These tools may be subject to service interruptions, software modifications, and pricing changes during the semester.

Generative AI is not required to complete any aspect of this course, and we caution you to not rely entirely on these tools to complete your coursework. Instead, we recommend treating generative AI as a supplementary tool only for exploration or drafting content. Ultimately, you (and not any AI tool) are responsible for your own learning in this course, and for all the work you submit for credit. It is your responsibility to critically evaluate the content generated, and to regularly assess your own learning independent of generative AI tools. Overreliance on generative AI may give you a false sense of how much you've actually learned, which can lead to poor performance on the midterm test or final exam, in later courses, or in future work or studies after graduation.

You are required to document all use of generative AI tools for any graded work in this course. The method for providing this documentation depends on the type of assignment.

- For assignments and projects: You must submit a complete and unedited transcript of your interaction with the AI tool alongside your main submission. This can be a shareable link, a direct copy-paste into a document, or a PDF export.
- For All Other Assessments: While you cannot attach a transcript, you are still required to keep a complete record of any AI assistance you use. The instructor reserves the right to request this transcript at any time up to the final grading of the course. You must be prepared to produce it immediately upon request.

Students with Disabilities or Accommodation Requirements

Students with diverse learning styles and needs are welcome in this course. If you have an acute or ongoing disability issue or accommodation need, you should register with Accessibility Services (AS) at the beginning of the academic year by visiting <https://studentlife.utoronto.ca/departments/accessibility-services>. Without registration, you will not be able to verify your situation with your instructors, and instructors will not be advised about your accommodation needs. AS will assess your situation, develop an accommodation plan with you, and support you in requesting accommodation for your course work. Remember that the process of accommodation is private: AS will not share details of your needs or condition with any instructor, and your instructors will not reveal that you are registered with AS.

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.

Accommodation for Personal Reasons

There may be times when you are unable to complete course work on time due to non-medical reasons. If you have concerns, speak to me or to an advisor in your College Registrar's office; they can help you to decide if you want to request an extension or other forms of academic consideration. They may be able to email your instructors directly to provide a College Registrar's letter of support and connect you with other helpful resources on campus.

Religious Accommodations

As a student at the University of Toronto, you are part of a diverse community that welcomes and includes students and faculty from a wide range of cultural and religious traditions. For my part, I will make every reasonable effort to avoid scheduling tests, examinations, or other compulsory activities on religious holy days not captured by statutory holidays. Further to University Policy, if you anticipate being absent from class or missing a major course activity (such as a test or in-class assignment) due to a religious observance, please let me know as early in the course as possible, and with sufficient notice (at least two to three weeks), so that we can work together to make alternate arrangements.

Missed Midterm Test Final Exam

If you cannot attend the midterm test, you are required to make a special request by using the special request form. You should do it as soon as possible. There will be no make-up midterm test. If you miss the midterm test due to a valid reason, we will shift the midterm test weight to the final exam. We encourage you to book an appointment with Learning Strategy Support if you are in this situation. More information is at:

<https://studentlife.utoronto.ca/service/learning-strategist-appointments/>

Missed Final Exam

If you cannot attend the final exam, you will need to make a petition to write a deferred exam. More information is at: <https://www.artsci.utoronto.ca/current/faculty-registrar/petitions/deferred-exams>

Transparency in grading

Throughout the term, we will try our best to inform students of the marks they have earned on MarkUs. Students are encouraged to do a self-check and report any calculation errors.

Learning Strategy Support

You are encouraged to book an appointment with Learning Strategy Support at <https://studentlife.utoronto.ca/service/learning-strategist-appointments/> during the semester.

Sometimes, we may also require you to book an appointment with Learning Strategy Support before we can grant you accommodation to your special request.

Mental Health and Well-Being

Your mental health is important. Throughout university life, there are many experiences that can impact your mental health and well-being. As a University of Toronto student, you can access free mental health and wellbeing services at Health & Wellness (<https://studentlife.utoronto.ca/department/health-wellness/>) such as same day counselling, brief counselling, medical care, skill-building workshops, and drop-in peer support. You can also meet with a Wellness Navigation Advisor who can connect you with other campus and community services and support. Call the mental health clinic at 416-978-8030 ext. 5 to book an appointment or visit <https://uoft.me/mentalhealthcare> to learn about the services available to you.

You can also visit your College Registrar to learn about the resources and supports available: <https://www.artsci.utoronto.ca/current/academic-advising-and-support/college-registrars-offices>.

If you're in distress, you can access immediate support: <https://uoft.me/feelingdistressed>

Quercus Info

This Course uses the University's learning management system, Quercus, where you will find the links to all course materials, and this is where you do the in-class exercises. While contents may not directly be on Quercus, you can find the links to them here. Please note that Quercus is not used for grading purposes.

Course Materials, including lecture notes

Course materials are provided for the exclusive use of enrolled students. These materials should not be reposted, shared, put in the public domain, or otherwise distributed without the explicit permission of the instructor. These materials belong to your instructor, the University, and/or other sources depending on the specific facts of each situation and are

protected by copyright. Students violating these policies will be subject to disciplinary actions under the Code of Student Conduct.

Fair and Honest Feedback to Team Members

This course provides every student with an opportunity to work with other students. Every team member needs to make contributions. We appreciate the diversity of our students, and we acknowledge that different students might make different contributions to their project. Therefore, we have provided the chance for the team members to give feedback to others. We encourage team members to raise professional, constructive, and actionable feedback to their team members. We do not tolerate personal feedback that presents harassment or discrimination. We encourage students to raise honest feedback that can help every team member to learn and improve teamwork.