Computing and Software
COMPSCI 1XD3
Computer Science Practice and Experience: Introduction to Software Design Using Web Programming
Winter 2025

McMaster University
ENGINEERING

Instructor Information

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Office: ETB 111
Office Hours:
Wednesday, 11:30 to 1:30

Class Times

Lectures

- Tuesday and Friday, 11:30 to 12:20, LRW B1007

Labs

- L01: Tuesday and Thursday, 8:30 to 10:20, BSB 249
- L02: Tuesday and Thursday, 12:30 to 2:20, BSB 249
- L03: Monday and Wednesday, 12:30 to 2:20, BSB 244
- L04: Tuesday and Thursday, 4:30 to 6:20, JHE 233A/234
- L05: Tuesday and Thursday, 4:30 to 6:20, BSB 249

Class Format

This is an In Person class.

Each week there will be two lectures that introduce important topics in Web Development. In the following week, the two 2-hour labs will allow you to complete practice exercises, work on your team project and assignments, and get one-on-one help with your TA. In most weeks, the first lab will be for individual work, and the second lab will be for team work. Labs will also contain activities to be submitted for a small completion grade.

There will be no labs scheduled in the first week.

Attendance and in-person participation in classroom activities is strongly recommended.

Course Dates: 01/06/2025 - 04/08/2025
Units: 3.00
Course Delivery Mode: In Person
Course Description: Introduction to different aspects of design: Identifying user needs, goals and desires and translating them into software, and structuring and communicating the structure of software to improve reliability, readability and adaptability. Topics include web languages and protocols, types and design patterns. Two lectures, two labs (two hours each); second term; may be offered also in the first term Prerequisite(s): COMPSCI 1JC3 and registration in Computer Science 1, or COMPSCI 1JC3 with a result of at least B; COMPSCI 1MD3 or MATH 1MP3 Antirequisite(s): COMPSCI 1XA3

Important Links

- Mosaic
- Avenue to Learn
- Student Accessibility Services - Accommodations
- McMaster University Library
- eReserves

- Full Stack Web Development for Beginners
- W3Schools
- Computing and Software Drop-in Help

- Equity and Inclusion
- 2SLGBTQIA+ Resources
- Black Lives Matter
- Indigenous Student Services
- MES Clubs

- Counselling and Well Being
- Student Success Centre
- Academic Advising
- Student Technical Support

- Google Chrome Accessibility
- Visual Studio Code Accessibility

Course Learning Outcomes

- Create a full stack web app involving synchronous and asynchronous communication between the client and the server, authentication, session management, and simple database access.

- Design and implement the user interface for a web app, following basic principles of user interface design.

- Explain how web development languages and web app architectures support modularity and separation of concerns (tiered architectures, language roles, functions, classes, objects, etc.).

- Compare and contrast the type systems of programming languages for web development.

- Write client-side scripts that respond important events in the life cycle of a web page (event-driven programming).

- Write client-side scripts that operate autonomously to produce animations and other dynamic graphical content for the user interface of a web app.

- Write server-side scripts that perform database operations and return the result to the client.

- Follow relevant best practices in security for the development of full stack web apps.

- Design web-based app solutions as part of a web development team working to identify and meet the needs of a client.

Lab Safety

The Faculty of Engineering is committed to McMaster University's Workplace and Environmental Health and Safety Policy which states: "Students are required by University policy to comply with all University health, safety and environmental programs". It is your responsibility to understand McMaster University Workplace and Environmental Health and Safety programs and policies. For information on these programs and policies please refer to McMaster University Health and Safety. The Lab Safety Handbook is available here, as well as on A2L.

Please abide by the following basic rules in the software labs:

- No food or drink in the lab at any time.
- There should be no bags in the aisles, as this creates a tripping hazard
- Make sure you know the location of the nearest fire extinguisher.
- Make sure you know whether the lab has a first aid kit and the location of it if it does.
- Make sure you know where the safety posters are located in the lab and can identify phone numbers and procedures in case there is a safety incident.

If you notice any conditions in the lab that you feel might be a safety issue, please let a TA or the instructor of the course know.

Course Schedule

This is a schedule of lecture topics and evaluations. The labs that accompany each lecture topic will happen the week after each set of two lectures. **The schedule is tentative and subject to change in consultation with the students.**

- Readings refer to chapter numbers in *Full Stack Web Development for Beginners* (https://ecampusontario.pressbooks.pub/webdev/)
- The Portfolio will be reviewed 3 times. The three reviews are worth a total of 5%.

	Week	Readings	Topics	Individual	Team
1.	**Jan 6**	1,2,4,6,7	Introduction; web app architectures and protocols; presentation tier; HTML & CSS basics		
2.	**Jan 13**	8-12	Principles of user interface design; flexible, mobile-first, and responsive design.		Team Formation (1%)
3.	**Jan 20**	14-19	JavaScript syntax; type system; functions; arrays; objects; the Document Object Model (DOM);	Web Layout Assignment Begins	
4.	**Jan 27**	20-22	Event-driven programming; functional programming; Input Elements.		Initial Client Report Due (2%)
5.	**Feb 3**	23, 24, 29	UI design principles; the HTML canvas.	Web Layout Assignment Due (5%) JavaScript Assignment	

				Begins	
6.	**Feb 10**	25-27	Classes and objects; DOM manipulation; client-side storage; JSON.	Portfolio Review	
	BREAK WEEK				
7.	**Feb 24**	28	Front-end framework review: TypeScript; React; Bootstrap; jQuery.	JavaScript Assignment Due (10%) Client-Side Test February 28 (20%)	Canvas Assignment Begins
8.	**Mar 3**	31-33	Logic Tier; server-side scripting; client-server communication; HTTP parameters; forms revisited.		
9.	**Mar 10**	34-36	Data tier; basic SQL; server-side scripting to update the database.		Canvas Assignment Due (10%) Development Plan Begins
10.	**Mar 17**	37-39	Server-side scripting to read from the database; HTML Tables; Asynchronous programming; AJAX.	Server-Side Assignment Begins Portfolio Review	Development Plan Due (2%)
11.	**Mar 24**	40, 42	Session management and authentication.		

12. Mar 31	41, 42	Security topics; Review	Server-Side Assignment Due (10%)	Project Increment (5%)
13. Apr 7			Server-Side Test April 8 (10%)	
	EXAM WEEK		Final Portfolio Review (5%)	Project Final Deliverable Due (20%)

Required Materials and Texts

Please sign in with your MacID here to view your booklist

Full Stack Web Development for Beginners
Authors: Sam Scott
Publication Date: 2024
Open Educational Resource (no cost to the student)

Handouts, slides, examples, readings, and class notes.
Available on Avenue (no cost to the student)

Course Evaluation

- Web Portfolio (work from approx. 12 labs): 5%
- Individual Assignments (4): 35%
- Tests (3): 30%
- Team Project: 30%
- *IDEA Conference Bonus: 1%*
- *OER Bonus: up to 3%*

Course Evaluation Details

Tests

Tests are worth 30% in total. They will be closed book though you may be provided with reminder sheets for the details of common syntax. The first test will mostly cover the presentation tier (HTML, CSS, JavaScript) the second test will cover the logic and data tiers (PHP, SQL, and AJAX).

Lab Deliverables

Most labs will have one or more items to hand in. These are short exercises or activities that are intended to be completed during lab time. They will be due at the end of each week and handed in by uploading them to your portfolio on the class web server. They will be graded as complete or incomplete (0 or 1). They are all equally weighted.

Individual Assignments

The individual assignments will involve writing simple web apps. You are encouraged to discuss the course material with your classmates, but the individual assignments must be your own individual effort. You may consult other sources for short code snippets, but the source of all copied code must be clearly documented in comments. Failure to do so may be a violation of academic integrity.

Every assignment and exercise in this course is carefully curated so that you should not have to go outside the course materials and assigned readings to find the tools and techniques required. When figuring out how to do an assignment, you should always go to the course materials and readings first. However, you are also encouraged to go beyond the material in the course to create more sophisticated items that could be used in a job interview or portfolio.

Team Project

Throughout the course you will work on a project with a team. You will identify a "client", interview them about their needs, and produce a full stack web app or collection of web pages and web apps to address those needs. Each team member will have a clear and well-defined role. There will be deliverables throughout the term that may include a team website, client meeting minutes, project plans, prototypes, and the final deliverable.

IDEA Participation

The IDEA Conference (https://nsbemcmaster.ca/idea-conference/) is organized by the McMaster chapter of the National Society of Black Engineers in partnership with McMaster's Women in Engineering, Engiqueers, American Indian Science and Engineering Society, and Engineers with Disabilities Clubs. The focus of the conference is "navigating a career in engineering through the lens of equity, diversity and inclusion". The IDEA Conference organizers will be visiting labs in week 2 to talk about the conference and offer to serve as a "client" for teams who would like to work with them.

OER Participation

The textbook for the course is an OER (Open Educational Resource). It will remain under development during the course and bonus marks will be available for students who contribute by reading the textbook, filling out surveys, pointing out errors, and providing content ideas for the book. Students who make significant contributions may be acknowledged in the text. Details on how to earn these bonus marks will be released as the course progresses.

Grading Scale

The McMaster 12 Point Grading Scale

Grade	Equivalent Grade Point	Equivalent Percentages
A+	12	90-100
A	11	85-89
A-	10	80-84
B+	9	77-79
B	8	73-76
B-	7	70-72
C+	6	67-69
C	5	63-66
C-	4	60-62
D+	3	57-59
D	2	53-56
D-	1	50-52

Grade	Equivalent Grade Point	Equivalent Percentages
F	0	0-49

Late Assignments

The **individual assignments** are due on the day listed in Avenue (i.e., up to 11:59:59 pm that day). **Lab deliverables** are due on the Sunday of the week they were assigned. After that, they are late. Late days are tracked by calendar date. For example, if the due date is November 1st and you hand the assignment in some time on November 2nd, it is one day late.

You can hand in late assignments or lab deliverables with no penalty, but you have a limit of 8 late days for all the individual assignments and milestones combined. If you go over that limit, late work will no longer be accepted. Please note that the final day to hand in any work for this course, regardless of how many late days you have remaining, will be the final day of classes.

For team deliverables, if there is some reason your group is unable to deliver on the due date, someone from the group must contact the professor to negotiate an extension.

Absences, Missed Work, Illness

Late Days

Your 8 late days do not include special or unforeseen circumstances (illnesses, family emergencies, etc.). If you are delayed in completing an assignment due to special or unforeseen circumstances, let your professor know as soon as you can so that you can negotiate a new due date.

Tests

If you miss a test for any reason, or use an MSAF for a test, you will still have to write it. You should contact the professor as soon as possible to reschedule the test.

Lab Deliverables

If you choose to MSAF a lab you will be given a grade of “complete” for that lab.

Assignments and Projects

See the late policies above. If you choose to MSAF an assignment or project deliverable, you will be given extra time to complete it.

Generative AI: Some Use Permitted

Using generative AI to generate images and other media to include in your web apps is permitted.

Copying code into an assignment, lab, or project or adapting code from another source without clearly citing the source in comments will be considered a violation of academic integrity, whether the code in question was generated by an automated assistant or written by a human being.

The purpose of an assignment, lab, or project is to assess what you can produce working on your own or with a group of peers. Using excessive amounts of code copied from elsewhere, even if properly cited, may affect your grade.

Although the use of generative AI is not prohibited in this course, using an automated assistant powered by a Large Language Model (LLM) to produce code is strongly discouraged during any part of the assignment, lab, or project completion process. In this introductory course, it is crucial that you take every opportunity to write your own code and solve programming problems yourself. This is the only way to develop the skills you will need to use LLMs effectively in the future for more complex and specialized software development. Researching specific issues online and discussing solutions with classmates can aid your learning, but the use of LLMs to produce code in an introductory programming course can short-circuit the learning process.

APPROVED ADVISORY STATEMENTS

Academic Integrity

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and

academic integrity. **It is your responsibility to understand what constitutes academic dishonesty.**

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at https://secretariat.mcmaster.ca/university-policies-proceduresguidelines/

The following illustrates only three forms of academic dishonesty:

- plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
- improper collaboration in group work.
- copying or using unauthorized aids in tests and examinations.

Courses with an On-line Element

Some courses may use on-line elements (e.g. e-mail, Avenue to Learn, LearnLink, web pages, capa, Moodle, ThinkingCap, etc.). Students should be aware that, when they access the electronic components of a course using these elements, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in a course that uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the course instructor.

Online Proctoring

Some courses may use online proctoring software for tests and exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other

applications/software during tests or exams. This software may be required to be installed before the test/exam begins.

Conduct Expectations

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the Code of Student Rights & Responsibilities (the "Code"). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online.**

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.

Equity, Diversity, and Inclusion

The Faculty of Engineering is committed to creating an environment in which students of all genders, cultures, ethnicities, races, sexual orientations, abilities, and socioeconomic backgrounds have equal access to education and are welcomed and treated fairly. If you have any concerns regarding inclusion in our Faculty, in particular if you or one of your peers is experiencing harassment or discrimination, you are encouraged to contact the Chair, Associate Undergraduate Chair, Academic Advisor or to contact the Equity and Inclusion Office.

Academic Accommodation of Students with Disabilities

Students with disabilities who require academic accommodation must contact Student Accessibility Services (SAS) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make

arrangements with a Program Coordinator. For further information, consult McMaster University's Academic Accommodation of Students with Disabilities policy.

Academic Advising

For any academic inquires please reach out to the Office of the Associate Dean (Academic) in Engineering located in JHE-Hatch 301.

Details on academic supports and contact information are available from:

https://www.eng.mcmaster.ca/programs/academic-advising

Requests for Relief for Missed Academic Term Work

In the event of an absence for medical or other reasons, students should review and follow the Policy on Requests for Relief for Missed Academic Term Work.

Academic Accommodation for Religious, Indigenous, or Spiritual Observances (RISO)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students should submit their request to their Faculty Office ***normally within 10 working days*** of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

Copyright and Recording

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act

and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors.

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

Extreme Circumstances

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, Avenue to Learn and/or McMaster email.