DALHOUSIE UNIVERSITY
COMPUTER SCIENCE

CSCI 4177/5709 - Advanced Topics in Web Development

Course Syllabus

Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq. We are all Treaty people.

Dalhousie acknowledges the histories, contributions, and legacies of the African Nova Scotia people and communities who have been here for over 400 years.

Instructor Information[1]

Instructor:	Gabriella Mosquera (*she, her)*	**Office:**	ONLINE
E-mail:	mosquera@cs.dal.ca	**Office Hours:**	See Brightspace
Class Meeting Time:	WF 11:35am - 12:55pm	**Room No:**	Goldberg 127
Tutorial Time:	T 2:35pm – 3:55pm	**Room No:**	ROWE 1020
Course Homepage:	https://dal.brightspace.com/		
Course TAs:	See BrightSpace		

Important Dates

- **Quiz Dates:** *See Brightspace*
- **Lab Deadlines:** *See Brightspace*
- **Munro Day (university closed):** Feb 2, 2024
- **Heritage Day (university closed):** Feb 19, 2024
- **Study Break (no classes):** Feb 19 - 23, 2024
- **Good Friday (university closed):** Mar 29, 2024
- **Final Withdrawal Date without financial penalty:** Jan 22, 2024
- **Final Withdrawal Date with financial penalty:** Feb 6, 2024
- **Final Withdrawal Date with a "W":** Mar 6, 2024

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[1] All assignment/lab/tutorial due dates, lecture/lab meetings, and office hours are provided using Local Time, i.e., Atlantic Daylight Time (ADT)
Our Lecture on May 31st, 2023 will be held in the Tupper Building, Theatre B.
CSCI 4177 & CSCI 5709 Tutorials will take place in Dentistry 3156 from May 1st, 2023 to May 20th, 2023, and will move to CHEB C170 from May 21st, 2023 to August 1st, 2023.

Course Description

This hands-on course examines the technologies and infrastructure required to support electronic commerce. The course examines the major components of the infrastructure such as networks, databases and data warehousing, electronic payment, security, and human-computer interfaces. Key web concepts and skills for designing, creating, and maintaining websites such as Grid Theory, HTML5, CSS, Javascript, AJAX theory, PHP, SQL and NoSQL. Other principles such as Web Accessibility, Usability, User eXperience, security best practices, and development frameworks, will be explored in detail through a combination of lectures, in-class examples and activities, individual tutorials, quizzes and online discussions.

Learning Outcomes

- Understand and implement HTML5's and server-side APIs, such as geolocation, offline application development options, and the HTML5 canvas, for the purposes of creating dynamic graphics and adding offline functionality.
- Understand and implement development frameworks to extend the front-end and back-end functionality of a web application.
- Judge the security requirements of a given application in order to implement protection measures against attacks and vulnerabilities
- Learn and apply advanced performance evaluation and monitoring techniques to ensure an efficient web application
- Interact with others and apply concepts discussed in class, to build interactive, usable, secure, and accessible medium size client-server web applications.
- Be more interested in current trends, technologies, and security principles used in web application development, their security requirements, and be able to apply ethical web development principles.

Course Rationale

Advanced Web Services (CSCI 4177), a 4th year BACS course, and Advanced Topics in Web Development (CSCI 5709), an MACS graduate course, are a collocated course focusing on advanced web development and design topics, and are also a required course for the Certificate in Web and Mobile Computing.

Class Format and Course Communication

- Content will be delivered via a combination of lectures, tutorials/labs, reference slides, videos, and interactive exercises.
- This course is delivered using a Hybrid-Flexible (HyFlex) delivery model, i.e., students are able to attend all lecture and lab sessions both in-person and online through Collaborate Ultra.
- All live sessions (e.g., lectures, labs, tutorials) will be recorded and shared on Brightspace to allow for synchronous and asynchronous attendance.
- Students must ask for the instructor's permission before recording class lectures.
- All course material will be posted through the course's Brightspace site. It is the student's responsibility to revise the pre-lecture material before lectures and tutorials/labs and post-lecture material after lectures and tutorials/labs.
- **Students who feel sick or unwell as asked NOT to come to class**. As an accommodation, **the Instructor will be live streaming every lecture through Collaborate Ultra,** so that students who are not able to be present in class do not suffer any penalties in following this request. As mentioned, **ALL Collaborate Ultra sessions will be recorded and shared** after the fact through Brightspace.
- Course announcements and deadlines will be posted through the course's Brightspace site, and the course Team's Channel. It is the student's responsibility to check their Dal e-mail, Course Teams Channel, and Brightspace account on a daily basis. To access your Dal e-mail see: **https://www.dal.ca/dept/its/o365/services/email.html**
- To access the Course Team's Channel, please visit the Course BrightSpace Site and go to the "Teams Course Channel" Tab.
- **The preferred means of communication for this course is MS Teams,** this allows for your messages to be given priority throughout the term. Though you may still use regular emails for communicating with the Instructor, do keep in mind that this method may result in your email not being answered promptly.

Instructor Meetings

- For Instructor meetings, as well as TA meetings, check the "**Booking Appointments**" **tab on our course's Brightspace site**.
- If you are unable to find a suitable time for you to meet the instructor, using the link listed on the "**Booking Appointments**" **tab**, contact the Instructor so that a more suitable meeting time can be made to accommodate your schedule.

Evaluation Criteria

35% Group Work

- 8% D1: Proposal
- 12% D2: Demo
- 15% D3: Report & Web App

65% Individual Work

- 30% Assignments:
  A1 (10%), A2 (8%), A3 (12%)
- 20% Quizzes:
  Best 4 out of 5 (5% each)
- 15% Participation (incl. tutorials and discussions):
  Best 5 out of 7 tutorials (2% each),
  Online discussions/engagement (5%)

Notes

- The grade conversion scale in Section 17.1 of the Academic Regulations, Undergraduate Calendar will be used for undergraduate.
- The grade conversion scale in Section 7.6.2 of the Graduate Studies Calendar will be used for graduate students.
- Late assignments are **not** accepted. However, no penalty will be assessed for assignments that are late due to documented situations (i.e., Student Declaration of Absence). Further, it is common knowledge that extenuating circumstances can arise with little notice. Therefore, **you are encouraged** to contact the Instructor as soon as possible so that accommodations can be made for you.
- Any grievance regarding marks must be brought to the attention of the instructor **within FIVE (5) days**.
- All assignments/labs/quizzes/activities are due at **11:59PM** on the specified due date.
- All assignments, labs, quizzes, and activities must be submitted electronically **ONLY**.
- Unless otherwise specified by the Instructor, **no collaboration is permitted** on assignments, labs, quizzes, or activities.
- Student **must achieve an overall average of 50% or higher on EACH examination/test** for the grade obtained in the examination/test to be taken into consideration towards the final grade. Further, the instructor reserves the right to revise all assignments, labs, and/or tutorials for cases in which this requirement is not met.

General Assignment Guidelines

These guidelines suggest points to consider when preparing, writing and presenting your work. Criteria for assessment will be based on attention to these general guidelines as well as on evidence of wide reading and reflection of the topics under consideration.

- Please ensure you have read, and understand **Dalhousie University policies on academic integrity**.
- Written reports and assignments must follow the template available of the course's learning management system (i.e., BrightSpace); in general, written reports and assignments are 1.5 or double spaced, pages should be numbered, font - Times New Roman 12-point size, margins – 2cm (5% deduction for any submission not matching the required format specification).
- Depending on a particular assignment, written work should have a bibliography or reference list of the items used in the preparation of the report, using the ACM or IEEE citation style only.
- **Assignments are due at 23:59PM on the due date**, unless specified otherwise by the instructor. **However**, all assignment dropboxes on Brightspace will close at 12PM (NOON) on the following day, i.e., students will be able to update their submissions on Brightspace UNTIL 12PM (NOON) of the following day (i.e., the assignment dropbox' end date) without a late penalty.
- **All written assignments must be submitted electronically via Brightspace**, unless specified otherwise by the instructor. **The only acceptable file format for written reports is PDF (5% deduction for any submission not matching the required format specification).**
- The submission file for written reports, assignments and/or labs **must be** named as follows:
  - For individual assignments: **A#_LastName_FirstName.pdf**
  - For individual labs: **L#_LastName_FirstName#.pdf**
  - For individual tutorials: **T#_LastName_FirstName#.pdf**
  - For group tutorials: **T#_Group#.pdf**
  - For group project deliverables: **D#_Group#.pdf**

  There will be a 5% deduction for any submission not matching the required file naming specification.
- **Assignment/Lab handouts will include information on where and how to submit your files. In general, the course instructor will require for you to submit your work through Timberlea and/or FCS' Git Lab site** (https://git.cs.dal.ca/).
- A **README file MUST** accompany any programming work you submit for this course, a README template is available through the course Brightspace site. **This README file must include the URL pointing to your work** along with other required information, i.e., it is possible

for you to choose your own URL for your assignments/labs/tutorials, as long as that URL is listed in your README file.

- Students must submit their README file through the corresponding Lab Assignment Dropbox on BrightSpace.
- Git Lab submissions must also include the expected README file.

- **For programming assignments submitted electronically through FCS' Git Lab site**, you will have to:
  - Ensure the following:
    - Your GitLab folder structure for Individual deliverables such as Tutorials and Assignments, and Group deliverables such as Project deliverables, should resemble a structure similar to that illustrated on Figure 1 or Figure 2.

```
CSCI 4177/5709 Tutorials
    - Tutorial1
    - Tutorial2
    ....

CSCI 4177/5709 Assignments
    - Assignment1
    - Assignment2
    ...

CSCI 4177/5708 Grp-xx
    - Individual name branch
```

Figure 1. *GitLab Folder Structure Example #1.*

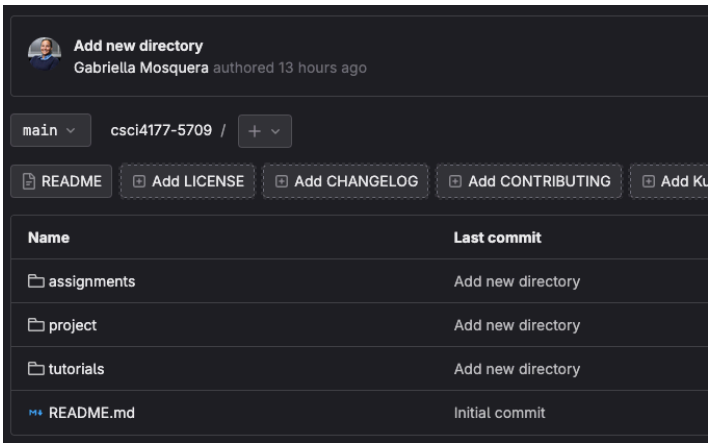

Figure 1. *GitLab Folder Structure Example #2.*

    - Setup your tutorial, assignment and project folders as a '**private project**'

    - Add the course and/or Instructor and TA's **CSIDs as 'Maintainers'** *(to be provided in class)* for your tutorials, assignments, and project folders.

- **For programming assignments submitted electronically through Timberlea**, or other hosting service, it is the student's responsibility to ensure that the deployed application can be remotely accessed through a URL:
    - **You may choose any deployment method for your programming work as long as it is remotely accessible through a browser, AND you communicate the URL for your work on your assignment's or tutorial's or project's README file.**

      Any alternate instructions on assignment submissions will be given during tutorials if needed.

    - A **README file MUST** accompany any programming work you submit for this course, a README template is available through the course Brightspace site. This **README file must include the URL pointing to your work** along with other required information, i.e., it is possible for you to choose your own URL for your assignments/labs/tutorials, as long as that URL is listed in your README file.
    - **Failure to submit** your README file through the corresponding assignment dropbox on BrightSpace will result in automatic ZERO for that assignment.
- **Assignment/Tutorial/Lab handouts will include further guidelines for requirements and submission of your work.**
- All web programming assignments **must be** submitted electronically according to the guidelines specified in each assignment and/or tutorial handout, which will also include s**ubmitting all your programming work through Git Lab, and your README files through Brightspace**. **Failure to submit** your programming work through Git Lab **will result in an automatic ZERO (0)** for that assignment, even if said assignment was submitted through Timberlea and/or Git Lab.

Midterm and Final Exam Requirements

There will be no midterms and/or final exams in this course. Students will be evaluated through a series of hands-on tutorials and activities, as well as non-cumulative Brightspace quizzes.

Required Texts and Resources

- There are no required textbooks for this course.
- Lecture and Lab/Tutorial slides and additional material (e.g., videos, handouts), will be posted on the course's Learning Management System (i.e., Brightspace)
- Additional assistance is available from the course Teaching Assistants.

Prerequisites

For undergraduate students enrolled in CSCI 4177, the only pre-requisite course is CSCI 3172. However, do keep in mind that CSCI 3172 has its own set of pre-requisites.

For graduate students, though there are no prerequisites for **CSCI 5709**, however, this is **NOT** an introductory course. As an advanced web development course, graduate students are expected to have prior web knowledge of Front-End (i.e., HTML5, CSS, JavaScript) and Back-End (e.g., JavaScript, SQL, NoSQL, PHP) web development languages, be able to design and develop customized websites without depending on any Front-End CSS Frameworks (e.g., Bootstrap), and be able to significantly customize any Front-End CSS Frameworks (e.g., Bootstrap, Skeleton, Foundation).

Tentative List of Topics

1. Web Usability
    - User Interface Design
    - User eXperience Design
    - User Centred Design
    - Prototyping
2. Advanced Web Security
    - Authentication and Authorization
    - Automated Testing
    - Quality Assurance
    - Documentation
3. Advanced Web Programming
    - Front-End APIs
    - Object-Oriented Programming
    - JSON
    - REST
4. Performance and Testing
    - Scalability and Performance Monitoring
    - Mastering HTTP Requests
    - Automizing Optimization Tasks
    - Network and Server Performance

Student Declaration of Absence

The Student Declaration of Absence (SDA) policy shall apply. https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/academic-policies/student-absence.html
In this course, the student has a maximum of **TWO (2) SDAs** per semester. In this case, to use an SDA in this course, **the student must notify the instructor via MS Teams or email** of their inability to meet a deliverable's deadline **BEFORE** its specified deadline **AND** submit the completed SDA form in the corresponding assignment dropbox on Brightspace (i.e., an SDA for Lab 1 must be submitted in the assignment dropbox for Lab 1 on BrightSpace). Upon notification, the student will have THREE days after the deadline to submit the deliverable for which they submitted an SDA. **SDA extensions are ONLY applied to the original due date of an assignment or lab**. Students **will not be able to use an SDA** in cases where the Instructor has already applied a 3-day (or higher) extension in a given assignment for the entire class.

Academic Standards

Failure to properly attribute sources in your work will be treated as an academic standards issue and points may be deducted for not following citation requirements. For example, forgetting to quote text taken from other sources, failure to include in-text citations, or a failure to include required information in the citations or references. Please see the resources on proper citation provided by the Dalhousie Writing Center (https://dal.ca.libguides.com/c.php?g=257176&p=5001261).

Please note that if it appears that the error was made with intent to claim other people's work as your own such as a lack of both citations and references, an allegation of plagiarism will be submitted to the Faculty Academic Integrity Officer, which could result in consequences such as a course failure.

In this course, you will be given instructions on how to source your work, as well as a README file template to use for this purpose.

Responsible Computing Policy

Usage of all computing resources in the Faculty of Computer Science must be within the Dalhousie Acceptable Use Policies (**http://its.dal.ca/policies/**) and the Faculty of Computer Science Responsible Computing Policy. For more information please see **https://www.dal.ca/content/dam/dalhousie/pdf/faculty/computerscience/policies-procedures/fcs_policy_local.pdf**

Use of Plagiarism Detection Software

All submitted code may be passed through a plagiarism detection software, such as the plagiarism detector embedded in Codio, the Moss (**https://theory.stanford.edu/~aiken/moss/**) Software Similarity Detection System, or similar systems. If a student does not wish to have their assignments passed through plagiarism detection software, they should contact the instructor for an alternative. Please note, that code not passed through plagiarism detection software will necessarily receive closer scrutiny. **https://cdn.dal.ca/content/dam/dalhousie/pdf/dept/university_secretariat/policy-repository/OriginalitySoftwarePolicy.pdf**

Use of Artificial Intelligence Tools

You MAY use AI-driven tools to assist you in learning but remember that your objective is to understand, achieve, and apply the course competencies and outcomes. While you may use tools for learning, specific assessments in this course will disallow the use of AI-driven tools to assert that you have attained course learning outcomes. This is because a graduate must be able to analyze, assess and produce work unassisted by AI technology. Where tools are allowed: you MUST acknowledge all tools used to assist you. If applicable, you MUST provide links to chat logs. Using AI-driven tools where prohibited constitutes an academic offence.

Copyright Notice

Student Health and Wellness

Taking care of your health is important. As a Dalhousie student, you have access to a wide range of resources to support your health and wellbeing. Students looking to access physical or mental health & wellness services at Dalhousie can go to the Student Health & Wellness Centre in the LeMarchant Building. The team includes: registered nurses, doctors, counsellors and a social worker. Visit **dal.ca/studenthealth** to learn more and book an appointment today.

Students also have access to a variety of online mental health resources, including telephone/texting counselling and workshops/training programs. Learn more and access these resources at d**al.ca/ mentalhealth**.

Culture of Respect[2]

Every person has a right to respect and safety. We believe inclusiveness is fundamental to education and learning. Misogyny and other disrespectful behaviour in our classrooms, on our campus, on social media, and in our community is unacceptable. As a community, we must stand for equality and hold ourselves to a higher standard.

What we all need to do:

1. **Be Ready to Act:** This starts with promising yourself to speak up to help prevent it from happening again. Whatever it takes, summon your courage to address the issue. Try to approach the issue with open-ended questions like "Why did you say that?" or "How did you develop that belief?"
2. **Identify the Behaviour:** Use reflective listening and avoid labeling, name-calling, or assigning blame to the person. Focus the conversation on the behaviour, not on the person. For example, "The comment you just made sounded racist, is that what you intended?" is a better approach than "You're a racist if you make comments like that."
3. **Appeal to Principles:** This can work well if the person is known to you, like a friend, sibling, or co-worker. For example, "I have always thought of you as a fair-minded person, so it shocks me when I hear you say something like that."
4. **Set Limits:** You cannot control another person's actions, but you can control what happens in your space. Do not be afraid to ask someone "Please do not tell racist jokes in my presence anymore" or state "This classroom is not a place where I allow homophobia to occur." After you have set that expectation, make sure you consistently maintain it.
5. **Find or be an Ally:** Seek out like-minded people that support your views, and help support others in their challenges. Leading by example can be a powerful way to inspire others to do the same.
6. **Be Vigilant:** Change can happen slowly, but do not let this deter you. Stay prepared, keep speaking up, and do not let yourself be silenced.

[2] Source: Speak Up! © 2005 Southern Poverty Law Center. First Printing. This publication was produced by Teaching Tolerance, a project of the Southern Poverty Law Center. Full "Speak Up" document found at: http://www.dal.ca/dept/dalrespect.html. Revised by Susan Holmes from a document provided April 2015 by Lyndsay Anderson, Manager, Student Dispute Resolution, Dalhousie University, 902.494.4140, lyndsay.anderson@dal.ca www.dal.ca/think.

University Statements

This course is governed by the academic rules and regulations set forth in the University Calendar and the Senate. https://academiccalendar.dal.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog&catalogid=111&loaduseredits=False

Territorial Acknowledgement

Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq. We are all Treaty people.

Dalhousie acknowledges the histories, contributions, and legacies of the African Nova Scotia people and communities who have been here for over 400 years.

Internationalization

At Dalhousie, 'thinking and acting globally' enhances the quality and impact of education, supporting learning that is "interdisciplinary, cross-cultural, global in reach, and orientated toward solving problems that extend across national borders." https://www.dal.ca/about-dal/internationalization.html

Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect. As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity. (read more: http://www.dal.ca/dept/university_secretariat/academic-integrity.html)

Accessibility

The Student Accessibility Centre is Dalhousie's centre of expertise for matters related to student accessibility and accommodation. If there are aspects of the design, instruction, and/or experiences within this course (online or in-person) that result in barriers to your inclusion please contact: https://www.dal.ca/campus_life/academic-support/accessibility.html for all courses offered by Dalhousie with the exception of Truro.

Conduct in the Classroom — Culture of Respect

Substantial and constructive dialogue on challenging issues is an important part of academic inquiry and exchange. It requires willingness to listen and tolerance of opposing points of view. Consideration of individual differences and alternative viewpoints is required of all class members, towards each other, towards instructors, and towards guest speakers. While expressions of differing perspectives are welcome

and encouraged, the words and language used should remain within acceptable bounds of civility and respect.

Diversity and Inclusion — Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness (Strategic Priority 5.2). (read more: http://www.dal.ca/cultureofrespect.html)

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution. (read more: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-con.html).

Fair Dealing Policy

The Dalhousie University Fair Dealing Policy provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at Dalhousie. (read more: https://www.dal.ca/dept/university_secretariat/policies/academic/fair-dealing-policy-.html)

Originality Checking Software

The course instructor may use Dalhousie's approved originality checking software and Google to check the originality of any work submitted for credit, in accordance with the Student Submission of Assignments and Use of Originality Checking Software Policy. Students are free, without penalty of grade, to choose an alternative method of attesting to the authenticity of their work, and must inform the instructor no later than the last day to add/drop classes of their intent to choose an alternate method. (read more: https://www.dal.ca/dept/university_secretariat/policies/academic/student-submission-of-assigments-and-use-of-originality.html)

Student Use of Course Materials

These course materials are designed for use as part of the CSCI courses at Dalhousie University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as books, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an

exception or limitation in Canadian Copyright law. Copying this course material for distribution (e.g. uploading material to a commercial third party website) may lead to a violation of Copyright law.

Learning and Support Resources

Please see: https://www.dal.ca/campus_life/academic-support.html