



Carleton University
School of Computer Science

COMP 2406 A&B

Fundamentals of Web Applications

Course Outline (F2026)

Last updated on July 30, 2026



Course Information

Instructor	Mark Lanthier
Email	Mark.Lanthier@carleton.ca
Office	HP 5380 (although Instructor office hours will be held at the Tutorial location)
Office Hours	Fridays 10-11:30am (except for days that tests are being written)
Best Way to Contact	In tutorial room or via email (contact me 24hrs in advance to arrange other times to meet)
Lab Coordinator	Lars Doyle (LarsDoyle@cmail.carleton.ca)
Teaching Assistants	(to be posted on course website)
Lectures	(unscheduled [pre-recorded])
Tutorial Times	Fridays at 10am in the scheduled tutorial location
Course Website	https://brightspace.carleton.ca/

Important dates and deadlines (including fall break, and statutory holidays) can be found here: [Dates, Deadlines, and Regulations—Registrar's Office](#).

Description

Introduction to Internet application development; emphasis on computer science fundamentals of technologies underlying web applications. Topics include: scripting and functional languages, language-based virtual machines, database query languages, remote procedure calls over the Internet, and performance and security concerns in modern distributed applications. Precludes additional credit for SYSC 4504.

Prerequisite(s): ([COMP 1006](#) or [COMP 1406](#)) with a minimum grade of C-. Calendar prerequisites are strictly enforced; this includes students writing deferred final exams. For details, see the SCS Prerequisite Policy: [Prerequisites](#).

Topics Covered

- Markup Languages (e.g., **HTML**, **CSS**)
- The **JavaScript** language
- Synchronous vs Asynchronous function calls
- The Document Object Model (**DOM**)
- Handling requests & responses using **HTTP**
- Client-side coding and data exchange using **JSON**, **AJAX**
- Server-side coding using **Node.js** and the **NPM** system
- Server-side templating (using **EJS** & **PUG**)
- The **Express** module simplified server-side coding
- **RESTful** Web API's
- **JSON** databases (using **MongoDB**)
- Authentication and Authorization using **Sessions** and **Cookies**
- Data validation using **Mongoose**
- Adjustments required for **mobile** apps

Learning Outcomes

By the end of this course, successful students will have demonstrated their ability to build modern full-stack web applications. They will be able to (a) create dynamic web pages, (b) write a web server including middleware components, (c) use data modeling and database technologies, (d) design accessible user interface and APIs using principles of RESTful design, and (e) implement authentication, authorization, and sessions.

Learning Materials and Other Course/Lab-Related Resources

Students are not required to purchase textbooks or other learning materials for this course. There is no textbook assigned to this course. Instead, there is a free in-depth set of course notes and coding examples available on Brightspace. All materials created for this course (i.e., course notes, coding examples, lecture recordings, tutorials, tutorial code, assignments, assignment code bases, marking schemes, tests, exams, and test solutions) remain the intellectual property of the instructor. They are intended for the personal and non-transferable use of students registered in the course. Reproducing, reposting, and/or redistributing any course materials, in part or in whole, without the written consent of the instructor, is a **copyright violation** and is **strictly prohibited**.

The notes provide an introduction to all topics in the course but there are many more detailed sources available freely online that you may use. A good introductory resource for the basics of **JavaScript**, **HTML**, and **CSS** that we will be using in the course is <https://www.w3schools.com/>. If you are looking for a good introductory **JavaScript/Node.js** book, "[Eloquent JavaScript](#)" by Marijn Haverbeke is available for free online.

The following (free) software is mandatory for the tutorials. Please download and install each:

- [Visual Studio Code](#) – for writing and testing your code
- [Google Chrome](#) – for testing your site
- [Node.js](#) – for running your servers
- [MongoDB Community Edition](#) (comes with **Compass**) – for using a database in your code

Assessment Scheme

Component	Weight	Details	Frequency / Dates
Tutorials	20%	Ten at 2% each	Recurring: Weekly
Assignments	20%	Four at 5% each	Due: Oct 8, Nov 5, Nov 26, Dec 10
In-Person Tests	40%	Best 4 out of 5 at 10% each	On: Sep 25, Oct 9, Oct 23, Nov 20, Dec 4
Final Exam	20%	You MUST pass	(to be announced)

Lectures & Course Notes

This course does not have scheduled lecture times. Instead, the lectures have been pre-recorded and you may watch them at a time that is convenient for you. Watching the lectures is not mandatory, as they are a guide through the course notes. You may choose to read through the course notes and simply watch portions of the lectures that correspond to sections that you find difficult to understand. You may find it sufficient to focus carefully on the tutorials (see below) for this course and use the updated "follow-along" course notes as a means of strengthening your knowledge with additional examples and explanations. Note that the pre-recorded lectures are based on last year's notes. The notes this year have been updated (i.e., reduced by 100 pages with most code removed so that you can follow-along with the descriptions as you load the code into **VSCode**).

Tutorials

There will be **10** self-guided tutorials during the term. They are a primary means of instruction in this course, so please do not view them as optional, nor as "extra work". If you take the time to do the tutorials properly, you will likely do well in the course. The tutorials will be available on Brightspace as quizzes and will take a varying amount of time ranging roughly from **75 to 120 minutes**, when done properly. The tutorials will only be available during a week-long range, so you must do them sometime within the designated time range. However, you do not have to do the tutorial all at once. You may pause the tutorial and continue at another time.



You will ONLY get a grade for the tutorials if you submit them by their due date. If you do NOT attempt a tutorial BEFORE the due date, you will not have access to the material afterwards, because Brightspace only grants access to those who attempt it. So, if you DO NOT plan to do/complete a tutorial on time, please at least log in and attempt the tutorial before the due date.

The tutorials are self-guided and you will not need any help from the TAs. You will simply follow the instructions and do everything it indicates. They are designed as an interactive guide through the course material. They will help you understand common issues/errors that arise when doing web programming. You are NOT allowed to use any form of A.I. to complete them (you will quickly see that such tools will be unnecessary). The questions on the tutorial are to be done in order. You MAY NOT go back to a previous question once you have selected an answer for it. So, take your time to **do each tutorial question slowly and carefully.**



If you "even appear to" rush through a tutorial question, you WILL receive 0 for that question. [A question is considered *rushed* if (a) you do not take the time to read & understand EVERY sentence written in the instructions, (b) you do not take the time to edit the required code properly, or (c) you guess at the answers].

We will be checking to confirm that you spent enough time on each question of the tutorial. If you lost marks for rushing through the tutorial, do not come to complain. Instead, put in an *honest* effort for the next tutorial by reading every sentence properly and writing the code as required.

In-Person Tests

There will be 5 tests during the term ... the best 4 will count towards your final grade. All tests MUST be written on paper during the Friday 10am-11:30am timeslot in the assigned tutorial room (or elsewhere with PMC accommodations), with no exceptions being made. Tests will be largely based on topics covered in the tutorials. Each test will be 2-pages and will require you to write code. There are NO multiple choice questions on these in-person tests. If you do the tutorials and assignments properly, and you understood what you did, you should be able to receive a perfect grade on the tests.

Upon completion of each tutorial, a **Quick Reference Guide** will be provided which you can use as a basis for preparing for the tests. These guides represent a summary of the material that you need to know to complete each test. Of course, the material is accumulative in that you are expected to know the material from previous topics, as it carries forward through the course.



All tests are expected to be completed individually, and without electronic aid; any communication or access of electronic devices (e.g. cellphones) during the test will be considered cheating. Use of **Smart**

Glasses (or other similar assistive technologies) before or during a test is strictly prohibited and is considered an academic integrity violation. Even if you have prescription glasses with assistive technologies, you will not be allowed to use them during the test, so please make sure that you have acceptable prescription glasses. The proctor has the right to ask to inspect your glasses before or during the test. In addition, unless authorized with PMC accommodations, you are NOT allowed to use **headphones** nor **ear buds** during a test. Also, during a test, if you choose to wear a **baseball cap**, **sunglasses** or anything else that would prevent a proctor from monitoring where your eyes are focused during the test, you will likely be asked by a proctor to move to a different seat. Lastly, you must submit your test before leaving the classroom or it won't be graded.

Assignments

There will be 4 assignments during the term. Here are the policies:

- Assignments are due **Thursday evenings at 11:59pm** on the due date. For every 15-minute interval that an assignment is late, there will be a deduction of **2%** off the grade. Hence, for example, an assignment that is late by 3 hours and 5 minutes will have a deduction of **26%**. If the assignment is late more than 12 hours, it will not be graded. Being "sick" on the day an assignment is due is not a valid excuse for not handing anything in. If you are sick the week leading up to the due date, you will not be exempt from doing it. It is best to start the assignment early, since you may get sick close to the due date.
- **Do not email** your assignments to the instructor or TAs, it **MUST** be submitted via Brightspace.

- It is **your responsibility** to ensure that your submission was successful. Submitting the wrong file or failure to correctly submit your work will result in a mark of zero for that assignment. Consequently, after you upload your submission to BrightSpace you must re-download it immediately and ensure that it is the correct type of file, it has the correct filename, and that it can be opened/run (as appropriate).
- You will be provided with feedback on your assignment through BrightSpace. You should ensure that the posted marks are correct.
- Any concerns regarding assignment grades must be brought to the attention of the TA who graded it. Such regrading requests must be done **no later than one week after the assignment grade has been released** on Brightspace. After this time, no remarking will be done.
- If any instructions are unclear, please ask for clarification. Incorrect assumptions or misunderstood directions will not be accepted as valid excuses. It is your responsibility to ensure you understand the question(s) completely.
- Any work submitted for grading must be **your own individual and original work**. However, you are allowed to use A.I. tools to complete your assignment, provided that you document such usage.

Final Exam



To pass this course, you MUST obtain a grade of 50% or more on the final exam. The time and place, as well as the format of the final exam will be announced later in the term. Attendance of this exam is mandatory. Do not make travel plans until the dates are known as no advance exams will be given. The exam period can be found at <https://carleton.ca/registration/academic-dates/#fall-2026>. The deferral process for formally scheduled exams is handled through the registrar's office, see [the registrars website](#) for more details (the deferred exam is likely to differ in form and content from the original final exam).

Lab Coordinator

The lab coordinator is responsible for organizing and overseeing the course's TAs and imposing submission rules to help ensure that marking goes smoothly. The lab coordinator is also responsible for distributing assignments to teaching assistants for marking. If you are missing an assignment grade or are unsure about the status of your assignment, you can contact the lab coordinator.

Academic Integrity, Collaboration & A.I. Policy

Students are expected to familiarize themselves with and abide by Carleton University's Academic Integrity Policy. Claiming ignorance of or confusion about the academic integrity standards as described in the Policy does not excuse a student from responsibility for violations of those standards

Although sharing of ideas among peers is encouraged, sharing of solutions, source code, plans, or any portion of gradable material is prohibited. **Collaborating on tests, assignments or final exams is strictly disallowed.** You must complete the work by and for yourself. You are never permitted to copy (or copy and modify) solutions (even if incomplete) from anyone or from the Internet. If you need help please use the course forum, see a TA, or contact your instructor.

Any coursework that you submit for grades must be your own original solutions developed specifically for the currently registered course offering. Any work submitted that does not meet this description will be considered an act of plagiarism. To ensure that no instances of academic misconduct have been committed, electronic tools may be used to analyze and compare submissions.

This is a course with a lot of syntax variations due to the many packages that we will be using. It can be difficult to find and understand errors that you will encounter within your code. Therefore, **you ARE ALLOWED to use artificial intelligence tools (e.g. ChatGPT, Claude, Copilot, etc.) for debugging purposes on your assignments only (and in some cases as stated on an assignment, to generate some content).** You can ask the A.I. to check your code for errors, and it will often give useful tips to help you correct your errors. You may NOT use A.I. for the tutorials, in-class tests nor final exam.



Be VERY careful in the way that you use A.I. tools. If you rely heavily on it, without taking time to think about your programming errors first, it is all too easy to have the A.I. fix your errors without you gaining a proper understanding of what was done. As a result, you can very easily fail the tests and final exam because you will not have gained an understanding of the material.

Please note, that it is also a serious offense to aid another student in committing plagiarism. This includes (but is not limited to): (a) sharing source code or other assignment, test, or tutorial solutions in part or in full, (b) posting full or partial solutions on the course forum, github, discord, an online source repository, hallway noticeboard, or elsewhere. To be clear, you are NEVER permitted to post, share, or upload course materials or your course work without explicit permission from your instructor.

For more information regarding Academic Integrity at Carleton including the policies, best practices, and the standard sanctions for misconduct, please visit the [Faculty of Science website](#).

Copyright & Fair Use of Materials

All material created for this course (including, but not limited to, lecture notes, in-class examples, tutorials, assignments, examinations, and posted solutions) remain the intellectual property of the instructor. These materials are intended for the personal and non-transferable use of students registered in the current offering of the course, or person with interest in using the material for the purpose of their own learning. Reposting, reproducing, or redistributing any course materials, in part or in whole, without the written consent of the instructor, is strictly prohibited.

Electronic Communication

To ensure that all course announcements are received, students are expected to **check their Carleton email on a daily basis**. Students may post questions related to course content on the Brightspace forums. Questions regarding the marking of your test/assignment should be directed to the individual who marked it. If your question is private or individual in nature please do not hesitate to contact the TAs or instructor via email. Emails to the TAs or instructor **must be from your email account** and include the course name in the subject line. Failure to do so may result in delays in response times or your message being missed completely. The instructor will attempt to answer every course-related email within 2 business days of the time it is received.

General Information

SCS Computer Laboratory

SCS students can access one of the designated labs for your course. The lab schedule can be found [here](#). All SCS computer lab and technical support information can be found [here](#). Technical support is available in room HP5161 Monday to Friday from 9:00 until 17:00 or by emailing SCS.Tech.Support@cunet.carleton.ca.

Undergraduate Academic Advisor

The SCS Undergraduate Advisor is available in Room 5302C HP; or via email at scs.ug.advisor@cunet.carleton.ca. The undergraduate advisors can assist with information about prerequisites and preclusions, course substitutions/equivalencies, understanding your academic audit and the remaining requirements for graduation. The undergraduate advisors will also refer students to appropriate resources such as the Science Student Success Centre, Learning Support Services and Writing Tutorial Services.

University Policies

Academic Calendar. For information about Carleton's academic year, including registration and withdrawal dates, see [Carleton's Academic Calendar](#).

Academic Accommodations. Carleton is committed to providing academic accessibility for all individuals. You may need special arrangements to meet your academic obligations during the term. The accommodation request processes, including information about the Academic Consideration Policy for Students in Medical and Other Extenuating Circumstances, are outlined on the Academic Accommodations website: <https://students.carleton.ca/course-outline/>.

Student Academic Integrity Policy. Every student should be familiar with the Carleton University Student Academic Integrity policy. A student found in violation of academic integrity standards may be sanctioned with penalties which range from a reprimand to receiving a grade of F in the course, or even being suspended or expelled from the University. Examples of punishable offences include plagiarism and unauthorized collaboration. Any such reported offences will be reviewed by the office of the Dean of Science. More information on this policy may be found on the ODS Academic Integrity page: <https://carleton.ca/registrar/academic-integrity/>.

Plagiarism. As defined by Senate, "plagiarism is presenting, whether intentional or not, the ideas, expression of ideas or work of others as one's own". Such reported offences will be reviewed by the office of the Dean of Science. More information and standard sanction guidelines can be found here: <https://science.carleton.ca/students/academic-integrity/>.

Unauthorized Collaboration. Senate policy states that "to ensure fairness and equity in assessment of term work, students shall not co-operate or collaborate in the completion of an academic assignment, in whole or in part, when the instructor has indicated that the assignment is to be completed on an individual basis".

Use of AI Systems (e.g., ChatGPT, etc.). Many of the assessed activities in this course were designed to be completed by an individual student working alone. Unless it is explicitly stated otherwise, the use of any AI tool to **complete work** will be considered academic misconduct. This includes, but is not limited to, chatbots (e.g., ChatGPT, Google Bard, Bing Chat), research assistants (e.g., Elicit), and image generators (e.g., Stable Diffusion, Dall-E), etc.

Student Rights & Responsibilities. Students are expected to act responsibly and engage respectfully with other students and members of the Carleton and the broader community. See the [7 Rights and Responsibilities Policy](#) for details regarding the expectations of non-academic behaviour of students. Those who participate with another student in the commission of an infraction of this Policy will also be held liable for their actions.