Course Outline – last updated September 22nd, 2021

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 or SYSC 2004) with a minimum grade of **C-**.

## Course Information

| | |
|---|---|
| **Instructor** | **Dave McKenney** |
| **Contact** | **David.McKenney@carleton.ca** |
| **Lecture Hours** | Lecture recordings will be used to support asynchronous study. At this time, there is no plan to run synchronous lectures for either section. |
| **Office Hours** | Mondays 1:30-3:30pm (via Discord) |
| **Course Website** | https://brightspace.carleton.ca/ |
| **Course Forum** | Discord server (link is available on the course website) |

## Course Delivery

This course will be delivered online. Students of both sections (A and B) will share the same website and will have access to the same materials, recordings, and so on. Lecture recordings will be used to support asynchronous learning. At this time, there is no plan to run synchronous lectures for either section. Tutorials and assignment workshops will be offered in a synchronous manner and recordings will be shared where possible.

This course is hosted on Brightspace. Brightspace is effectively our online classroom, and so you are required to be familiar with everything posted on it. Be sure to check out our course page at least 3 times a week.

The instructor, lab coordinator, and TAs will be available via Discord during scheduled hours to answer questions about course content and assignments. Students will be required to use an alias that includes their first and last name, as listed on Brightspace, in the course Discord, and any other course meetings or activities (Zoom, etc.).

## Required Textbook

There will be no required textbook purchase for this course. A good introductory resource for the basics of the JavaScript, HTML, and CSS that we will be using in the course is https://www.w3schools.com/. Additional resources will be posted on the course Discord server and on the course website throughout the term. If you are looking for a good introductory JavaScript/Node.js book, I would recommend the most recent edition of "Eloquent JavaScript" by Marijn Haverbeke. It is available for free online.

## Necessary Equipment and Software

There will be a lot of programming throughout the course using JavaScript, HTML, and CSS. You will need to install Node.js (version 14) from https://nodejs.org/en/. This should also install NPM (Node package manager), which you will need as well. You will need some tools to edit your code. Some popular choices are Visual Studio Code and Atom. As a web browser, it is recommended to use Google Chrome. Later in the course, we will start using MongoDB. The community edition installation resources can be downloaded from here.

In addition to a desktop or laptop with access to reliable high-speed internet, you will also need a microphone to be able to communicate orally during synchronous components and, preferably, a webcam.

Course Outline – last updated September 1st, 2021

## Learning Outcomes

By the end of this course, successful students will have demonstrated their ability to build modern full stack web applications. This includes the ability to:

- create dynamic web pages.
- write a web server using middleware components.
- use data modeling and database technologies.
- design and implement a client-server API using principles of RESTful design.
- implement authentication, authorization, and sessions within the context of a web application.

## Assessment Scheme

Your performance in this course will be assessed using several components:

- There are **4 programming assignments**. No late assignments are accepted.
- **Weekly quizzes** give you high-level practice on the lecture-specific course material. They are not timed and will be open for several days. You will be given two attempts on each quiz.
- **10 Tutorials**. The best 8 are worth 25% of your final grade. The two lowest tutorial grades will be dropped.

The grades you achieve on these components will be weighted using the following scheme:

| | |
|---|---|
| 4 Programming Assignments (15% each) | 60% |
| 10 weekly quizzes (1.5% each) | 15% |
| 10 Tutorials (best 8 out of 10 counted) | 25% |

## Attendance

Attendance is optional for all synchronous activities, including tutorial sessions and assignment workshops. Note, however, that these scheduled activities will be key opportunities to ask questions and get real-time feedback.

## Topics Covered

Below is a summary of topics the course will cover:

- Web Concepts, HTTP
- JavaScript
- Functional Programming and Closures
- Markup Languages (e.g., HTML, CSS, XML, Bootstrap)
- Synchronous vs Asynchronous function calls
- Client- and Server-side coding in JavaScript
- JavaScript execution environments: Browsers and Node.js
- Node.js and the NPM system
- JSON databases (using MongoDB), and possibly SQL databases (using SQLite)
- Server-side templating (using Pug, etc.)
- Sessions and Cookies, AJAX, Web Sockets
- Cloud deployment and hosting (e.g., OpenStack, Heroku)

A detailed breakdown of topics together with a tentative calendar is available on the course website.

## Course Copyright

Course Outline – last updated September 1st, 2021

## Academic Integrity

Everything you submit for marks in this course (i.e., assignments, quizzes, tutorials, etc.) must be the result of your own work. You are never permitted to copy (or copy and modify) solutions (even if incomplete) from anyone, including from lecture/tutorial/workshop code examples or from the Internet. It is also a serious offense to help someone else commit plagiarism. You are never permitted to provide another person access to the rough work, assignment specifications, or source code that you or anyone else has written. If you suspect that someone has been able to acquire a copy of your work, then you must inform the instructor of the course immediately. Please also note that electronic tools may be used to analyze and compare submissions to ensure that no instances of academic misconduct have been committed.

If you are unsure of the expectations regarding academic integrity (how to use and cite references, how much collaboration with classmates is appropriate), ask your instructor. Sharing assignment, tutorial or quiz/exam specifications or posting them online (to sites like Chegg, CourseHero, OneClass, etc.) is considered academic misconduct. You are never permitted to post, share, or upload course materials (including lecture slides and recordings) without explicit permission from your instructor. Academic integrity offences are reported to the office of the Dean of Science. Penalties for such offences can be found on the ODS webpage: https://science.carleton.ca/academic-integrity/.

## Important Considerations

Late assignments are never accepted for any reason. Technical problems do not exempt you from this requirement, so if you wait until the last minute and then have issues with your connection, you will still receive a mark of zero. Consequently, you are advised to:

- periodically submit your progress (i.e., upload partially completed assignments and tutorials)
- attempt to submit your final submission at least one hour in advance of the due date and time
- download your submission and verify the contents after submitting

If your submission is improperly packaged, or your code is not running for whatever reason, you will get a mark of zero. The Carleton email servers will reject Javascript source files, so assignments and tutorials must be uploaded through Brightspace.

## Undergraduate Academic Advisor

The Undergraduate Advisor for the School of Computer Science is available in Room 5302C HP; or by 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.

## SCS Computer Laboratory

SCS students can access one of the designated labs for your course. The lab schedule can be found at: https://carleton.ca/scs/tech-support/computer-laboratories/. All SCS computer lab and technical support information can be found at: https://carleton.ca/scs/technical-support/. 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.

## University Policies

For information about Carleton's academic year, including registration and withdrawal dates, see Carleton's Academic Calendar.

**Pregnancy Obligation.** Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit Equity Services.

**Religious Obligation.** Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit https://carleton.ca/equity/focus/discrimination-harassment/religious-spiritual-observances/.

**Academic Accommodations for Students with Disabilities** If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. For more details, visit the Paul Menton Centre website.

**Survivors of Sexual Violence.** As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: carleton.ca/sexual- violence-support

**Accommodation for Student Activities.** Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, see the policy.

**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 awarded penalties which range from a reprimand to receiving a grade of *F* in the course or even being expelled from the program or University. Examples of punishable offences include: plagiarism and unauthorized co-operation or collaboration. Information on this policy may be found here.

**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. Standard penalty guidelines can be found here.

**Unauthorized Co-operation or 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". Please refer to the course outline statement or the instructor concerning this issue.

**Students are invited to discuss any concerns with the instructor at the earliest opportunity**.