Computer Systems Security

Page last updated: January 10, 2023.
Update Jan 10, 2023 - Minor updates to university policies.

Calendar Description

Introduction to information security in computer and communications systems, including network, operating systems, web and software security; Passwords, authentication applications, privacy, data integrity, anonymity, secure email, IP security, security infrastructures, firewalls, viruses, intrusion detection, network attacks.

Overview

- Instructor: David Barrera (he/him/his) - davidbarrera@cunet.carleton.ca
- Teaching Assistants:
  - Ethan Thompson (he/him)
  - Maxwell Keleher (he/him)
- Office hours:
  - Instructor: Via Zoom by appointment
  - TAs: Wednesday during class time or via Discord
- Dates: Jan 9 - Apr 12 2023 (excl. Feb 20 and Feb 22 due to reading week)
- Assigned classroom: 520 Southam Hall
- Prerequisites: (COMP 3000 or SYSC 4001) and COMP 3109. Precludes additional credit for SYSC 4810.

Learning Modality

This course has been explicitly designed so that those who are unable to attend campus can still obtain and review all assessment material. Office hours and TA support is available through Discord, email or video meetings, and properly justified extensions are generously granted. There are only 2 mandatory in-person assessments: the midterm on Feb 27, and the final exam (date TBD).

Flipped classroom. Lectures for the following week’s content will be video-recorded and posted to Brightspace on Wednesdays. Students are asked to allocate time to watch the lectures and review supporting materials (slides, book chapters, source code, etc.) prior to the in-person sessions on Mondays and Wednesdays (4:05pm-5:25pm). In-person class time will be used as follows:

- Mondays - Interactive sessions where the instructor assigns questions/problems sets for students to solve (sometimes in groups) and discuss together. These problems are designed to deepen understanding of the material, as well as help clarify concepts presented in the video lectures. Note that the instructor will not
lecture during this time, nor is the aim of the session to recap the week’s material. TAs will take notes of salient discussions and clarifications, and post them to Brightspace after the session for those who are unable to attend.

- **Wednesdays** - TA-run sessions where students receive support for the 5 assignments and any other practical aspect in the course. Later in the term, sessions may be used to review solutions to earlier assignments. These sessions are designed to be hands-on, so students who attend are required to bring their laptops and in-progress assignments.

Weekly in-person sessions are intended to support students who have questions or need assistance with the week’s material. Attendance is not mandatory.

A Discord server will also be available for course discussion and asynchronous support. Details to be posted on Brightspace.

### Grading Scheme

- **40% Individual assignments:** Assignments should be worked on and submitted individually (not group work). Assignment details and due dates will be posted on Brightspace. Please contact TAs directly with questions/support relating to these assignments.
  - A1: Race conditions and access control (8%)
  - A2: Rootkits (8%)
  - A3: Public keys and certificates (8%)
  - A4: Web security (8%)
  - A5: Network security (8%)
- **10% Weekly quizzes**
- **25% Midterm** (Feb 27 in person during class time. Covers all material to date)
- **25% Final exam** (in person organized by examination services, date TBD. Covers all course content)

*Late submission policy:* All deliverables will be penalized 10% of the maximum grade per day late (each 24 hour period following the deadline counts as one day). If you require an extension, please ask!

### Assignments

Approximately every 2 weeks, a new assignment will be posted. These assignments are designed to help students experiment with practical applications of the theory taught in the course. Solutions will be due before the next challenge is made available, which is typically within 2-3 weeks. This pacing should give students at least 2 TA support sessions (Wednesdays) to attend, if needed.

### Quizzes

To ensure students are keeping up with the lectures, quizzes will be posted (almost) weekly to Brightspace. These quizzes are short, mostly multiple choice, and must be completed before the following week’s quiz is made available. Quizzes may only be attempted once, and have a time-limit once started. Please monitor the course calendar closely to ensure you complete your quizzes on time.

### Other course policies

**Individual work:** This course has no group component, and thus all deliverables should be completed and submitted individually. To help enforce this policy, students may be randomly selected after each deliverable to explain their code to the TAs/instructor in a one-on-one session.

**Late submission policy:** All deliverables (incl. quizzes, challenges, project components and any other deliverable not listed above) will be penalized 10% of the maximum grade for that deliverable per day late. For example, if an assignment solution worth 30 points is submitted 6 hours late, the maximum possible grade for that assignment would be 27/30. If you require an extension, contact the instructor to avoid losing marks. Note that screenshots or other malleable evidence that a deliverable was completed on time will not be accepted. Only the server-side file upload time on Brightspace will be considered.
Undergraduate Academic Advisor

The Undergraduate Advisors for the School of Computer Science are available in Room 5302HP; or by email at scs.ug.advisor@cemnet.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.

Academic Integrity violations within the Faculty of Science

Students found in violation of the Student Academic Integrity Policy (below) in Computer Science (COMP) courses are subject to severe penalties, as detailed at the Office of the Dean of Science (ODS) page: https://science.carleton.ca/academic-integrity. If you are unsure of the expectations regarding academic integrity (how to use and cite references, how much collaboration with lab- or class-mates is appropriate), ASK your instructor or the head TA for your labs. Sharing assignment or quiz specifications or posting them online (to sites such as Chegg, CourseHero, OneClass) is considered academic misconduct. You are never permitted to post, share, or upload course materials without explicit permission from your instructor.

COMP 4108 addendum on integrity violations: Beyond any other standard university policies, in COMP 4108 any student submitting work including uncited portions originating from someone else, is subject to a mark of negative 100% on the entire work item. For example, if a lab assignment is worth 10%, the 10% is lost plus an additional 10% penalty, making the best possible course mark 80%. Both students may be penalized if the infraction involves copying from another student. Each student must write up submitted work individually from their own personal notes, unless given permission explicitly in writing to do otherwise by the Instructor or head TA.

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/tech-support/. Technical support is available in room HP5161 Monday to Friday from 9:00 until 17:00 or by emailing support@scs.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 this link.

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 this page.

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.

**COVID-19**

It is important to remember that COVID is still present in Ottawa. The situation can change at any time and the risks of new variants and outbreaks are very real. There are a number of actions you can take to lower your risk and the risk you pose to those around you including being vaccinated, wearing a mask, staying home when you’re sick, washing your hands and maintaining proper respiratory and cough etiquette.

Feeling sick? Remaining vigilant and not attending work or school when sick or with symptoms is critically important. If you feel ill in any way do not come to class or campus. If you feel ill or exhibit symptoms while on campus or in class, please leave campus immediately. In all situations, you must follow Carleton’s symptom reporting protocols.

Masks: Carleton strongly recommends masking when indoors, particularly if physical distancing cannot be maintained. The instructor and TAs have committed to wearing masks during all student interactions.

Vaccines: While proof of vaccination is no longer required as of May 1 to attend campus or in-person activity, it may become necessary for the University to bring back proof of vaccination requirements on short notice if the situation and public health advice changes. Students are strongly encouraged to get a full course of vaccination, including booster doses as soon as they are eligible, and submit their booster dose information in cuScreen as soon as possible.