

COMP 4108 (Fall 2024)

Computer Systems Security

Last updated: Dec 31, 2023.

Overview

- Instructor: David Barrera (he/him/his) - davidbarrera@cunet.carleton.ca
- Teaching Assistants:
 - Ethan Thompson (he/him/his) - EthanThompson@cmail.carleton.ca
 - Huzaiifa Patel (he/him/his) - huzaiifapatel@cmail.carleton.ca
- Office hours:
 - Instructor: Via Zoom by appointment
 - TAs: Fridays during class time or via email (but not via Discord)
- Schedule: Wednesdays and Fridays 11:35am - 12:55pm
- Dates: Jan 08, 2024 - Apr 10, 2024
- Required textbook: Computer Security and the Internet: Tools and Jewels from Malware to Bitcoin by P.C. van Oorschot (2021, second edition, Springer). Available in hardcopy from bookstores, softcopy via university library, PDFs for personal use from author's website.

Topics Covered

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

Calendar Description

Precludes additional credit for SYSC 4810. Priority to BCS students in the Computer & Internet Security and Cybersecurity streams. Calendar prerequisites are (COMP 3000 or SYSC 4001) and COMP 2108 (formerly COMP 3109). New and old prerequisites will be accepted, i.e. COMP 2108, COMP 3109 or COMP 4109. All students must have COMP 3000 or SYSC 4001.

Learning Modality

Flipped classroom. Lectures for the week's content will be video-recorded and posted to Brightspace on Mondays. 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 Wednesdays and Fridays (11:35pm-12:55pm). In-person class time will be used as follows:

- **Wednesdays** - 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 lecture. TAs will take notes of salient discussions and clarifications, and post them to Brightspace after the session for those who are unable to attend. These sessions are intended to support students who have questions or need assistance with the week's material. Attendance is not mandatory, but encouraged.

- **Fridays** - TA-run sessions where students receive support for the assignments. 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 asked to bring their laptops and in-progress assignments.

Our goal is to ensure that students feel safe and supported throughout the term, so this course has been designed to support all students, including those who are unable to come to campus. All assessment material is available to review remotely, office hours and TA support is available through email or video meetings, and properly justified extensions are generally granted. Students, however, must ensure they are on campus for the two in-person assessments (midterm and final).

Grading Scheme

- 10% Weekly quizzes
- 30% 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 (6%)
 - A2: Rootkits (6%)
 - A3: Public keys and certificates (6%)
 - A4: Web security (6%)
 - A5: Network security (6%)
- 30% Midterm
- 30% Final exam

Quizzes

To ensure students are keeping up with the lectures, quizzes will be posted (approximately) 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. PMC student should notify the prof ASAP to ensure they are given the correct completion time overrides.

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.

Other course policies

Individual work: This course has no group component, and thus all deliverables should be completed and submitted individually. Unless it is explicitly stated otherwise, the use of any AI tools 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. To help enforce this policy, students may be asked to explain their deliverables 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 Advisors

The Undergraduate Advisors for the School of Computer Science are available in Room 5302HP; 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

Students taking a COMP course can access the SCS computer labs. The lab schedule and location 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 staff may be contacted in-person or virtually, see this page for details: <https://carleton.ca/scs/tech-support/contact-it-support/>.

University Policies:

Academic Accommodations

Carleton is committed to providing academic accessibility for all individuals. Please review the academic accommodation available to students here: <https://students.carleton.ca/course-outline/>.

Academic Integrity

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”.