COMP 4108 A (Sept. 2025, Fall) (updated: 11 Aug 2025)
Computer Systems Security

Instructor: P. Van Oorschot

Instructor email: paulv@scs.carleton.ca

Office hours (5173HP): 1:00 –2:00pm Tues
10:30-11:30am Thurs

Course Website:
https://brightspace.carleton.ca/d2l/home/369330

Class Location: check Carleton Central

Lecture Times: 11:30-1:00pm, Tues + Thurs

Head TA: Eric Leblanc
TA email: EricLeblanc@cmail.carleton.ca
TA details/office hours to be posted as term starts.

Tutorial Times: none

Important dates/deadlines and statutory holidays: see https://students.carleton.ca/academic-dates/
• *Fall term: classes Sept.3–Dec.5, 2025 (fall break/no classes: Oct.20-24, 2025)*

Course Calendar Description

Information security in computer and communications systems. Topics include: design principles; operating system security and access control; web and software security; malicious software, security infrastructure; secure email; network authentication; firewalls; intrusion detection; IP security; network attacks; wireless security.
Precludes additional credit for CSEC 3108, SYSC 4810.
Prerequisites: (COMP 3000 or SYSC 4001) and COMP 2108.
Students not meeting the prerequisites must withdraw from the course, or will be de-registered.

Learning Materials and Other Course/Lab-Related Resources

Textbook (available in the university bookstore): *Computer Security and the Internet: Tools and Jewels from Malware to Bitcoin (2021)*, 2nd edition (the 1st edition does not have Chapter 12); other references used will be accessible online or via Brightspace. Softcopy chapter PDFs are available on the instructor's web page. Thus, **students are not required to purchase textbooks or other learning materials for this course.**

Topics. The preliminary outline of topics (subject to revision as the term proceeds) follows. Chapters listed are in the course text. For a few topics, supplementary material will be provided.
• (2.0 lectures) Ch.1: Basic concepts and principles of computer/internet security.
• (2.0 lectures) Ch.5: Operating system security and access control.
• (3.0 lectures) Ch.6: Software security–exploits and privilege escalation.
• (3.0 lectures) Ch.7: Malicious software.
• (2.5 lectures) Ch.8: Public key certificate management and use cases.
• (2.5 lectures) Ch.9: Web and browser security.
• (2.0 lectures) Ch.10: Firewalls and tunnels.
• (2.0 lectures) Ch.11: Intrusion detection and network-based attacks.
• (2.0 lectures) Ch.12: Wi-Fi (wireless) security – supplementary material to be provided.
• (2.0 lectures) Bluetooth (wireless) security – supplementary material to be provided.

Course objectives: to understand basic principles of computer security; to become aware of how computer systems are vulnerable to exploitation, and corresponding protection means; to understand practical threats and carry out simple security analysis useful in software and system development; to gain familiarity with basic concepts in operating systems and Internet security.

Assessment Scheme

To pass the course *requires a passing grade (at least 50%) on the average* of the midterm exams. Exams include material noted in class, from assignments, and from extra materials provided. Students are *expected to attend all classes* including to know the material they're responsible for.
35% midterm exam #1: *Tues. Oct.14* in-class, closed-book (no aids of any sort)
35% midterm exam #2: *Thurs. Nov.20* in-class, closed-book (no aids of any sort)
30% programming-based assignments (5@6% each). Due dates (subject to change by head TA):
Sept.24, Oct.8, Oct.29, Nov.12, Dec.3. To be submitted via **Brightspace** or *designated site.*
Some assignments are individual, others optionally in groups of 2, as indicated in instructions. Students need OpenStack accounts if they do not already have one from a previous course. For all questions about the assignments, contact the Head TA.

Late Work Policy. Late assignments receive a penalty of 25% per day, and thus a grade of zero (0) after the 4th day late, unless special permission has been granted in writing. Fill out this form to request for consideration of such special permission: *academic considerations form*.

You are advised to submit your final work at least one hour prior to the official due date/time, in anticipation of electronic glitches, software or system outages, and connectivity issues.

Missed Midterm Policy. *Students missing a midterm exam receive a grade of 0. If there are exceptional circumstances, a student may ask if they qualify for special consideration using this academic considerations form as soon as practically possible. If approved, alternate evaluation may be used such as a substitute exam, oral exam, or other means of the instructor's choosing.*

SCS Laptop Requirement. Every student who enrolled in a 1000-level (first year) course offered by the School of Computer Science (SCS) after the 2020/2021 school year is required to have a laptop. For more information, please visit https://carleton.ca/scs/scs-laptop-requirement/ and review the requirements at https://carleton.ca/scs/scs-laptop-requirement/laptop-specs/.

Undergrad Academic Advisors. SCS Undergrad Advisors are available in 5302HP; or by email at scs.ug.advisor@cunet.carleton.ca. They can assist with information on prerequisites and preclusions, course substitutions/equivalencies, understanding your academic audit and the remaining requirements for graduation. They can also refer students to resources such as the Science Student Success Centre, Learning Support Services and Writing Tutorial Services.

SCS Computer Lab. 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/.

Academic Accommodations and Regulations

Academic Accommodation. 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 are outlined on the Academic Accommodations website (https://students.carleton.ca/course-outline/).

Generative AI Tools. In this course you may use AI tools (like ChatGPT) for error-checking of grammar and spelling. Other use of such tools in any work submitted for grading is prohibited.

Academic Integrity. Students are expected to uphold the values of academic Integrity, which include fairness, honesty, trust, and responsibility. Examples of actions that compromise these values include but are not limited to plagiarism, accessing unauthorized sites for assignments or tests, and unauthorized collaboration on assignments. Misconduct in scholarly activity will not be tolerated and will result in consequences as outlined in Carleton University's Academic Integrity Policy. A more detailed explanation of Academic Integrity and a list of sanctions for the Faculty of Science can be found on the Faculty of Science Academic Integrity website. Students are expected to be familiar with and abide by Carleton University's Academic Integrity Policy.

COMP 4108 addendum on academic integrity: Beyond other standard university policies, any student submitting work in this course, including uncited portions originating from someone else, is subject to a mark of negative 100% on the entire work item. For example, if an assignment is worth 6%, the 6% is lost plus a further 6% penalty, making the best possible course mark 88%. Both students may be penalized if the infraction involves copying from another student. Except for authorized group work, each student must write up submitted work individually from their own personal notes, unless given written permission explicitly to do otherwise.

Student Rights & Responsibilities

Students are expected to act responsibly and engage respectfully with other students, members of Carleton, and the broader community. See the 7 Rights and Responsibilities Policy for details on the expectations of non-academic behaviour of students. Those who participate with another student in committing an infraction of this Policy will also be held liable for their actions.