

# COMP 5119 (Winter 2024)

## Internet of Things Security

Page last updated: Dec 31, 2023.

### Course description

The course examines security issues related to the Internet of Things (IoT), with a main focus on consumer IoT devices and software, including technical design and configuration. It considers security aspects related to applications, platforms, and data communication protocols, with wireless access playing a foundational role. The course explores how IoT security issues often resemble those in the ordinary (pre-IoT) Internet, but with different risks due to IoT devices creating links between virtual and physical worlds.

**New for 2024:** This year the course will have a “environmental sustainability” theme, so paper discussions will be directed toward the intersection of IoT security and sustainability. This includes, but is not limited to: climate change, waste management, power consumption, corporate social/environmental responsibility, open standards and right to repair, etc.

### Mandatory prerequisites

Introductory courses in both operating systems (e.g., COMP 3000) and computer networks (e.g., COMP 3203). Strongly recommended prerequisites: introductory course(s) in computer and Internet security and cryptography. Students lacking such background have in the past struggled to successfully complete this research-oriented course.

This is a graduate-level course intended for thesis-based students. It is generally unsuitable for course-based Master’s students lacking substantial prior experience in security, networking, and cryptography. The self-evaluation due in week 2 (see below) aims to assess a student’s background suitability for this course.

### Overview

- In person meetings: Wednesdays 14:35-17:25
- Dates: Jan 08, 2024 - Apr 10, 2024
- Instructor: David Barrera (davidbarrera@cunet.carleton.ca)
- Office hours: by appointment.
- Recommended textbook (for background): 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.

### Grading Scheme

- 5% Self evaluation on security background
- 20% (Short) research paper on IoT longevity
- 10% One page reports on 5 student presentations (max 1 per day)
- 15% Discussion leads
- 40% (Long) final paper
- 10% Poster presentation

*Late submission policy:* Late assignments and projects receive a zero (0) grade by default, unless special permission has been granted in writing, in advance. Extensions will be granted on a case-by-case basis. You are advised to submit your final work at least one hour in advance of the official due date/time, in anticipation of electronic glitches, software or system outages, and connectivity issues.

## Course format and attendance

As a research and discussion-oriented graduate course, students are expected to attend all classes in person, with reliance on the Brightspace platform for resources and assignment submissions. The delivery of classes over the term is in two stages: (1) Instructor delivery of initial lectures; (2) student-led discussions of designated papers, with support from Instructor and fellow students.

## Individual work and policy on integrity violations

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 for deliverables will be considered academic misconduct. This includes, but is not limited to, chatbots (e.g., ChatGPT, Google Bard, Bing Chart), research assistants (e.g., Elicit), and image generators (e.g., Stable Diffusion, Dall-E), etc.

An academic integrity violation in a graduate course may result in a course failure (F) or expulsion from the program. In student-submitted work in this course, both in written projects and presentations, no figures, diagrams or tables may be copy/pasted from any source, unless written permission from the author of that material is obtained (and presented). Beyond any other standard university policies, in COMP 5119 any student submitting work including uncited text from someone else (or figures/tables as noted above), is subject to a mark of negative 100% on the entire work item. For example, if an item 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.

## 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”.