

# COMP 5119 (Winter 2022)

## Internet of Things Security

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### 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.

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 and cryptography. The self-evaluation due in week 2 (see below) aims to assess a student's background suitability for this course.

### 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.

### Overview

- Meetings (online, no recordings): Wednesdays from 8:35-11:25
- Dates: Jan 12 - Apr 6 (excl. Feb 23 for reading week)
- Instructor: David Barrera (davidbarrera@cunet)
- Office hours: TBD or 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
- 15% Short research paper
- 15% One page reports on 5 student presentations
- 15% Discussion lead for one paper (by sign-up)
- 10% Final project plan
- 30% Written final project report
- 10% Student project 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 online synchronously, with reliance on the Brightspace platform for resources and assignment submissions. Video meetings will not be recorded. The delivery of classes over the term is in three stages: (1) Instructor delivery of initial lectures; (2) student-led discussions of designated papers, with support from Instructor and fellow students; followed by (3) student presentations related to their projects.

Prior to each class, students are expected to have read the paper(s) designated for that day, in order to contribute in an informed manner. If you are not living in Ottawa this term or you are in a different time zone, email the Instructor during the first week of class including your registration student ID and details of your country/time zone, to discuss if suitable accommodations can be made.

## Undergraduate Academic Advisor

The Undergraduate Advisor for the School of Computer Science is available in Room 5302C HP; by telephone at 520-2600, ext. 4364; or by email at [undergraduate\\_advisor@scs.carleton.ca](mailto:undergraduate_advisor@scs.carleton.ca). The undergraduate advisor can assist with information about prerequisites and preclusions, course substitutions/equivalences, understanding your academic audit and the remaining requirements for graduation. The undergraduate advisor 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 5900H addendum on integrity violations

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 online presentations, no figures, diagrams or tables may be cut-and-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 5900H 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

**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. Some examples of offences are: plagiarism and unauthorized co-operation or collaboration. Information on this policy may be found in the Undergraduate Calendar.

**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”. Reported offences will be reviewed by the office of the Dean of Science. Penalties for violations of Carleton’s Policy on Academic Integrity will normally be applied as follows:

- First offence, first-year students (< 4.0 credits completed): No credit for assessment(s) in question, or a final grade reduction of one full letter grade (e.g., A- becomes B-), whichever is a greater reduction.
- First offence (anyone else): A grade of F in the course

- Second offence (anyone): A grade of F in the course and a one-term suspension from studies
- Third offence: Expulsion from the University

Note: While these are the standard penalties, more severe penalties may be applied when warranted.

**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.

**Academic Accommodations for Students with Disabilities.** The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or [pmc@carleton.ca](mailto:pmc@carleton.ca) for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send your course instructor your Letter of Accommodation at the beginning of the term, and 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 course instructor to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable) at <http://www2.carleton.ca/pmc/new-and-current-students/dates-and-deadlines>

**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. More information can be found [here](#).

**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](http://carleton.ca/sexual-violence-support)

**Religious Obligation:** Write to the course 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 the Equity Services website: <http://www2.carleton.ca/equity/>

**Pregnancy Obligation:** Write to the course 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 the Equity Services website: <http://www2.carleton.ca/equity/>

**Medical Certificate:** The official medical certificate (form) accepted by Carleton University for the deferral of final examinations or assignments in undergraduate courses can be accessed from: <http://www.carleton.ca/registrar/forms>