

Last updated: December 25, 2022 (preliminary version, subject to change)

COMP 3000 (WINTER 2023)

OPERATING SYSTEMS

GENERAL INFORMATION

Class time: Section A: 02:35 pm - 03:55 pm, Mondays and Wednesdays
Section B: 06:05 pm - 07:25 pm, Tuesdays and Thursdays

Instructor: [Lianying Zhao](mailto:Lianying.Zhao@scs.carleton.ca) (firstname.lastname@scs.carleton.ca)

Location: Refer to the public class schedule

Office hours:

A list of teaching assistants and their contact/office hours information will be posted once the course starts.

Tutorials: Check your schedule and room location on Carleton Central

A1: 08:35 am - 09:55 am, Fridays

A2: 10:05 am - 11:25 am, Thursdays

A3: 10:05 am - 11:25 am, Fridays

B1: 01:05 pm - 02:25 pm, Wednesdays

B2: 11:35 am - 12:55 pm, Fridays

B3: 01:05 pm - 02:25 pm, Mondays

Course Website: Please use [Brightspace](#) as the primary source of information, where important instructions can be found that must be followed.

COURSE CALENDAR DESCRIPTION

Operating system implementation course stressing fundamental issues in design and how they relate to modern computer architectures. Assignments involve the modification and extension of a multitasking operating system.

Includes: Experiential Learning Activity

Precludes additional credit for SYSC 4001

Prerequisites: COMP 2401 with a minimum grade of C- and (COMP 2402 or SYSC 2100).

Note: this means a strong C programming background is required

LEARNING OUTCOMES

By the end of this course, students should:

- Have a strong conceptual model of how an operating system works that can facilitate software development/testing and answer questions pertaining to an operating system's everyday use.
- Be able to write/modify C code that uses low-level Linux services and implement simple Linux kernel extensions (modules).
- Understand the basic use and architecture of virtual-machine based and container based cloud architectures.

Note that in order to achieve these objectives students should have come into this course with a strong background in C programming and general application development.

GRADING SCHEME

2%: Lecture participation *

18%: Tutorial participation (9 in total)

20%: Assignments (4 in total)

25% Midterm exam (in class, **online**, open book) **Feb 15th** (A), **Feb 16th** (B)

35%: Final Exam (during the final exam period, **online**, open book)

Assignment and tutorial due dates will be made available in [Brightspace](#). Tentative dates for assignments: JAN31, FEB12, MAR19, APR02. Finalized due dates will be no earlier. Tutorial submissions are usually due four days after the tutorial date.

Alternative grading schemes might be applied at the end of the term so there is a chance that your final grade is higher than calculated by strictly following the default scheme above. Tutorials are an important part of the learning process and basis for assessment (i.e., assignments and exams).

*: You can receive participation marks when asking good questions 1) during lecture, 2) by emailing the instructor, or 3) during office hours with the instructor. Note that the marks only depend on the **quality** of such interactions (NOT necessarily quantity), e.g., relevance to discussed topics, sufficient thinking. You may also react to occasional polls during lecture to get part of the participation marks.

COMMUNICATION

Lectures will be in person and recorded. Recorded lectures will be posted in Brightspace. Course discussions will be on [Microsoft Teams](#). Such discussions may include but are not limited to assignment clarifications, lecture polls, ad-hoc announcements, and tutorial discussions.

All work submissions (tutorials, assignments, and exams), as well as important (e.g., grading-related) announcements, course material and grade posting, will be through Brightspace.

TEXTBOOK

The course will be using the textbook [Operating Systems: Three Easy Pieces](#). The chapters of this textbook are available for free online; you can also buy a full epub, PDF, or paper copy if you wish.

This course focuses much more on reading/modifying code rather than writing code. Thus, John Aycock's book, [Reading and Modifying Code](#), is worth reading to better understand how reading code differs from writing code.

TOPICS COVERED

Tentative lecture schedule by topics (subject to change):

- Introduction to Operating Systems
- OS Abstractions
- Facilities for Users/Programmers
- File Systems and Storage Management
- Inter-Process Communication and Concurrency
- I/O Management and Kernel Modules
- Memory Management
- Containerization and Virtualization
- Security Considerations

Important dates and deadlines can be found [here](#), including class suspension for the winter break, and statutory holidays.

IMPORTANT CONSIDERATIONS

Assignments/tutorials submissions are handled electronically (i.e., through Brightspace) and there is no "grace period" with respect to a deadline - an assignment submitted even

one minute after the deadline is late and will not be accepted by the system. Technical problems do **not** exempt you from this requirement, so if you wait until the last minute and then have issues with your connection, you will still receive a mark of zero. Consequently, you are advised to attempt to submit your work at least one hour in advance of the due date and time. Contact the TAs/instructor in case of any problems.

Format errors, missing files, and other technical/non-technical upload issues will not constitute the justification for another attempt. Only what has been uploaded by the due date and time will be graded. Consequently, after you upload your submission to Brightspace you should re-download it immediately for verification and ensure that all needed files are there in the right format.

AUTHORIZED AND UNAUTHORIZED COLLABORATION

Collaboration on all work is allowed **except** for the midterm and the final exams. Collaboration, however, should be clearly acknowledged.

For assignments, while you may get help from others and even collaboratively solve technical problems, the **code and answers submitted** should all be your own work. For example, you may not divide an assignment into parts, give a part to another student or anyone else to solve, and then submit that work as your own. You have to have participated in the creation of every part of your submitted work. An easy way to make sure this happens is to never share files regarding coursework or copy and paste answers. Instead, only meet together (virtually) to work on an assignment (e.g., to discuss your understanding/confusion) and then **separate** to write up your own solutions.

Similarity between submitted assignments that has not been appropriately documented will be treated as plagiarism - the same as copying on a midterm or a final - and will be submitted to the Dean for disciplinary action.

Sharing assignment or exam specifications or posting them online (to sites like Chegg, CourseHero, OneClass, etc.) is considered academic misconduct. You are never permitted to post, share, or upload course materials without explicit permission from your instructor. Academic integrity offences are reported to the office of the Dean of Science. Penalties for such offences can be found on the ODS webpage:
<https://science.carleton.ca/academic-integrity/>.

POLICIES AND RESOURCES

For information about Carleton's academic year, including registration and withdrawal dates, see [Carleton's Academic Calendar](#).

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/>.

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 <https://carleton.ca/equity/focus/discrimination-harassment/religious-spiritual-observances/>.

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: carleton.ca/sexual-violence-support

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.

SPECIAL INFORMATION

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 or exhibit COVID-19 symptoms 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 has paused the COVID-19 Mask policy, but continues to [strongly recommend masking](#) when indoors, particularly if physical distancing cannot be maintained. It may become necessary to quickly reinstate the mask requirement if pandemic circumstances were to change.

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. Please note that Carleton cannot guarantee that it will be able to offer virtual or hybrid learning options for those who are unable to attend the campus.

All members of the Carleton community are required to follow requirements and guidelines regarding health and safety which may change from time to time. For the most recent information about Carleton's COVID19 response and health and safety requirements please see the [University's COVID-19 website](#) and review the [Frequently Asked Questions \(FAQs\)](#). Should you have additional questions after reviewing, please contact covidinfo@carleton.ca.

Doctor's note or medical certificate: In effect for Winter 2023 term, in place of a doctor's note or medical certificate, students are advised to complete the **self-declaration** form available on the Registrar's Office website to request academic accommodation for missed course work including exams and assignments. Students should also discuss with the course instructor the required accommodations arising from the COVID-19 situation.