COMP 3000 A (Winter, 2026)
Operating Systems

Instructor: Ben Earle

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Office Location: Room 3222, VSIM

Best Ways to be in Touch: in class, via email, or during student hours

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

Class Location and Time: Please check Carleton Central for your lecture location and time.

Tutorial Location and Times: Please check Carleton Central for your specific tutorial location and time.

Course Website: Brightspace course site

Important dates and deadlines can be found here: Dates, Deadlines, and Regulations—Registrar's Office, including class suspension for fall, winter breaks, and statutory holidays.

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. Precludes additional credit for SYSC 4001. Prerequisite(s): COMP 2401 with a minimum grade of C- and COMP 2402.

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Learning Material(s) and Other Course/Lab-Related Resources

Learning Material	Options for Purchasing	Approximate Cost
"Operating System Concepts", Silberschatz, Galvin, Gagne (10th ed)	Bookstore, Amazon	88 CAD (Kindle) 135 CAD (Loose leaf)
"Operating Systems: Three Easy Pieces", Arpaci-Dusseau, Arpaci-Dusseau, Reiher	Available online	Free online

Students are not required to purchase textbooks or other learning materials for this course.

Topics Covered and Learning Outcomes

Learning Outcomes
To pass this course, students must demonstrate the ability to:
- **describe** the primary functions and components of an operating system.
- **analyze and evaluate** the design principles and trade-offs involved in operating system architecture (i.e. how policies and algorithm selection will affect system performance) and make system level recommendations for specific use cases.
- **apply** design concepts to write C programs to interact with the Linux kernel using POSIX system calls, implement kernel extensions, or simulations of concepts taught in this course.

The schedule below is **approximate** and variations, due to external circumstances (e.g., severe weather events) and student progress, will occur. Reading material of the two textbooks is not fully aligned, as they have different accent and detailing of concepts. As a result, the alignment of the suggested reading is also approximate.

Week	Topic/Content	**Suggested** Readings/Prep for Class
1	Admins and Introduction	OSC Book Ch 1 (3EP Book Ch 2)
2	OS Structures, Processes, IPC	OSC Ch 2, 3 (3EP Ch4, Ch5, Ch6)
3	Threads and Scheduling	OSC Ch 4, 5 (3EP Ch26, Ch7, Ch8)
4	Scheduling and Synchronisation	OSC Ch 5, 6 (3EP Ch9, Ch10, Ch 26)
5	Synchronisation and Deadlocks	OSC Ch 7, 8 (3EP Ch28, Ch31, Ch32)
6	Deadlocks and Memory Management	OSC Ch 8, 9 (3EP Ch32, Ch13,15-17)
7	Memory Management and Mid-term	OSC Ch 9 (3EP Ch 18-20)
8	Virtual Memory	OSC Ch 10 (3EP Ch 21-23)
9	Mass Storage	OSC Ch 11 (3EP Ch 36-38, 44)
10	Kernel I/O Subsystem and FS Interface	OSC Ch 12, 13 (3EP Ch 39, 40)
11	FS Implementation and End-term	OSC Ch 14 (3EP Ch 42, 43, 45)
12	File System Internals and Virtual Machines	OSC Ch 15, 18 (3EP VMs)
13	Virtual Machines and Exam Prep	OSC Ch 18 (3EP VMs)

Assessment Scheme
Grade Breakdown

COMPONENT	GRADE VALUE	DATE
Tutorial Quizzes (best 8 of 10)	16 %	Weeks 2-12
Assignments (best 3 of 4)	24 %	Weeks 3-4,5-6,8-9,10-11
In class participation (**Bonus**)	3%	Sporadically throughout lectures (Wooclap)
Midterm	12.5 %	Feb. 23rd (**closed book, in class, MCQ+long form**)

End Term	12.5 %	April 1st (**closed book, in class, MCQ+long form**)
Final Exam (**must get >30%**)	35 %	Exam period (**closed book, written, long-from answers**)

If the exam grade is higher, it will replace the lowest of the in-term test marks (mid-term or end-term). If you missed one of the in-terms tests, its weight will be shifted to the exam. You're highly advised to attend and attempt all tests.

Late and Missed Work Policies

Late Work

Late submission of Tutorial Quizzes and/or Assignments will not be accepted. Their deadlines are calculated to have extra time built in. We will publish two dates: the due date, and the deadline. The due date is when you should submit your solution. The 2-day difference between the due date and the deadline is an automated, no questions asked, no judgement passed, grace period. If you miss your **deadline**, you will receive zero marks. Plan your work on Tutorial Quizzes and Assignments to complete by the **due date**.

Missed Work

Short-term (5 days or less): The policy of selecting the best 8 of 10 Tutorial Quizzes and 3 out of 4 Assignments, automatically provides a buffer for short-term, exogenous, exigent circumstances. Should such circumstances be recurrent, they should be considered under the Long-Term Accommodation.

Long-term (> 5 days): Should some external, unavoidable circumstance become recurrent or long-term, please submit a *[longer-term accommodation](#)* form. *If it is approved, the following will hold.*

If less than 50% of Assignments or Tutorial Quizzes is missed, its weight will be spread over the submitted portions. For example, if 5 of 10 tutorials are missed, then 2 will be disregarded due to the best-8-of-10 policy, while the submitted 5 will each have 3.2% of the final grade. Similar computation holds for the Assignments.

If **more** than 50% of Assignments or Tutorial Quizzes is missed, then 1/2 of the missed weight will be considered lost, while the rest will be shifted to the final exam. For example, if 3 of 4 assignments are missed, then 1 will be dropped due to the best-3-of-4 policy, 1 submitted assignments will have combined weight of 12% of the final course grade, and the exam will have 41% of the final course grade. Notice that, in this example, the maximum grade for the course becomes 94/100.

School of Computer Science Laptop Requirement (only applies to on-campus courses) Every student that has been enrolled in a 1000-level (i.e., first year) course offered is required to have a laptop. This includes COMP1001, COMP1005, and COMP1006. For more information, please visit https://carleton.ca/scs/scs-laptop-requirement/ and then review the requirements at https://carleton.ca/scs/scs-laptop-requirement/laptop-specs/.

Undergraduate Academic Advisors (only for UG course)

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/.

Mental Health and Wellness

The Carleton Wellness Website is a wonderful resource link to include in the course outline for students.

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/).

Chat GPT/Generative AI Usage

As our understanding of the uses of AI and its relationship to student work and academic integrity continue to evolve, students are required to discuss their use of AI in any circumstance not described here with the course instructor to ensure it supports the learning goals for the course.

In general, you are permitted to use AI tools to assist you in writing code. However, you bear the full responsibility for the outcome. In particular, if you are unable to address a question from your TA about your code, you will lose marks. If the AI tool "halucinates" a statement (and they do far more frequently than you may expect), you will bear the responsibility for its failure. AI can and will introduce bugs/features into your code, and they are (yes, all of them) are remarkably bad at algorithmic generalisation tasks. So, to slightly paraphrase a quote from "Harry Potter and the Chamber of Secrets": Never blindly trust anything that can think for itself

if you don't know where it keeps its brain ... or how it works. *Do it yourself, train and trust your mind and skill. Also consider the fact that your lecturer may know a way to deceive an AI.*

Note that the mid-term test, the end-term test, and the final exam will not allow you access to AI tools. If you have used AI instead of your own mind for Tutorial Quizzes and Assignments, then in-term tests and the exam will become an unforgiving challenge.

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, unauthorized collaboration on assignments or exams, and using artificial intelligence tools such as ChatGPT when your assessment instructions say it is not permitted.

Misconduct in scholarly activity will not be tolerated and will result in consequences as outlined in Carleton University's Academic Integrity Policy. A list of standard sanctions in the Faculty of Science can be found here.

Additional details about this process can be found on the Faculty of Science Academic Integrity website.

Students are expected to familiarize themselves with and abide by Carleton University's Academic Integrity Policy.

Student Rights & Responsibilities

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

Student Concerns

If you have any concerns regarding this course, your first point of contact is me. Please email me or visit during my student hours, and I will do my best to address your concerns. If I cannot resolve the issue, the next point of contact is the School of Computer Science at studentconcerns@scs.carleton.ca. If the concern remains unresolved, the final point of contact is the Office of the Dean of Science at ODScience@carleton.ca. Please follow this order of contact.

Note: You can also bring your concerns to Ombuds services.