COMP 3008A (Fall, 2026)

Software Structures for User Interfaces

Instructor: Moses Akazue
Class location: Room location is posted on Carleton Central
Email: mosesakazue@cunet.carleton.ca
Student Hours: By appointment
Best ways to be in touch: in class, via email, or during office hours
Teaching Assistants: Wednesdays 12:30 pm - 13: 30 pm & Fridays 12:00 pm – 13:00 pm at HP 4125.
Lecture times: Wednesdays and Fridays, 10:00 to 11:30 am
University dates and deadlines: Please check the official academic dates
Course website: On Brightspace

Course Calendar Description

Concepts and principles related to building user interfaces, and their application in implementing interfaces in "front-end" programming contexts. Topics may include: reactive programming, input and output factors, application interfaces and infrastructure, typical patterns used to implement them, and organization and management of these aspects within software.

- Precludes: additional credit for SYSC 4130
- Prerequisite(s): (COMP 2404 or SYSC 3010 or SYSC 3110) and (COMP 2406 or SYSC 4504)

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

- Note that students are not required to purchase textbooks or other learning materials for this course. Additional materials will be available on Brightspace throughout the term. Preliminary course slides will be posted to Brightspace before class and complete slides will be posted after class. Lectures will not be recorded. In the case of instructor unavailability, lectures may be given over Zoom or recorded and published on Brightspace.

Learning Material (*optional*)	**Options for Purchasing**	**Approx. Cost**
Interaction Design: Beyond Human-Computer Interaction (6th Edition, 2023) by Helen Sharp et al.	Carleton University Bookstore and from online retailers like Amazon. Older versions are fine	$82
Designing the User Interface: Strategies for Effective Human-Computer Interaction (6th Edition) by Ben Shneiderman et al.	Carleton University Bookstore and from online retailers like Amazon. Older versions are fine	$106

- Note that all materials created for this course (including, but not limited to, lecture notes, in-class examples, assignments, and exams) remain the intellectual property of the instructor. These materials are intended for the personal and non-transferable use of students registered in the current offering of the course. Reposting, reproducing, or redistributing any course materials, in part or in whole, without the written consent of the instructor, is strictly prohibited.

Topics Covered and Learning Outcomes

Human-computer interaction (HCI) is concerned with the design, implementation, and evaluation of interactive systems. Topics covered in this course include HCI foundations, human cognition, understanding users and tasks, interaction and interface design principles, conceptual models, prototyping, input and output factors, accessibility, reactive and event-driven interfaces, user-interface software structures, application interfaces and infrastructure, functional interface implementation, and usability evaluation.

Week	Date	Topic	Content	Due
1	W: Sep 9	Introduction	Introduction to HCI	
	F: Sep 11		Basic HCI concepts	
2	W: Sep 16		Design principles	
	F: Sep 18	Understanding the user	Attention and visual search	Assignment 1
3	W: Sep 23		Perception, memory, cognitive frameworks, and Human error	
	F: Sep 25		Observations, interviews, and surveys	
4	W: Sep 30		Personas, scenarios, and task analysis	
	F: Oct 2		Journey mapping and identifying design opportunities	
5	W: Oct 7		Design requirements, interaction flows, and state modelling	Assignment 2
	F: Oct 9	Designing interfaces and interactions	Interaction styles, information presentation, and function allocation	
6	W: Oct 14		Conceptual models	
	F: Oct 16		Prototypes	
7	W: Oct 21		Input, output, accessibility, and interaction modalities	Assignment 3
	F: Oct 23	Structuring and implementing interactive systems	Reactive and event-driven interfaces	
8	W: Oct 28		**No Classes (Fall Break)**	
	F: Oct 30			
9	W: Nov 4		User-interface software structures	
	F: Nov 6		**Midterm**	
10	W: Nov 11		Application interfaces and infrastructure	
	F: Nov 13		From prototype to functional interaction	
11	W: Nov 18	Testing and evaluation	Usability inspection and heuristic evaluation	Assignment 4
	F: Nov 20		Participant ethics and evaluation planning	
12	W: Nov 25		Usability testing	
	F: Nov 27		Analyzing findings and evidence-based redesign	
13	W: Dec 2	Reporting and share-out	Writing good reports and communicating design rationale	
	F: Dec 4		Project demonstrations/poster sessions 1	Project demo/report
14	W. Dec 9		Project demonstrations/poster sessions 2	

Learning objectives

Upon completing COMP 3008, you will be able to:

- Explain how principles of HCI and human cognition influence the design of interactive systems.
- Identify user needs, tasks, and contexts of use using appropriate user-centred design methods.
- Apply established interaction and interface design principles to design and critique user interfaces.
- Develop conceptual models and interactive prototypes that communicate interface structure, behaviour, and flow.
- Explain how input and output, events, state, software structures, and application infrastructure support interactive behaviour.
- Translate an interaction design or prototype into a functional interactive interface using an appropriate implementation technology.
- Evaluate an interactive interface using appropriate usability methods and use the findings to refine and justify the design.

Assessment Scheme

COMPONENT	GRADE VALUE	NOTES
Assignments	40 %	• Four assignments to be submitted on Brightspace. • Every assignment has a due date and a grace period. You can submit during the grace period, but you cannot ask questions about the assignment. Assignments submitted after the grace period will not be accepted. If you have any extenuating circumstances, you can submit the appropriate form (see Deferral section). • You have one week after an assignment grade is posted to contact your TA with any questions or concerns; after one week, no requests can be made and all grades are final.
Midterm	30 %	• The midterm will take place in class during class time and will be closed book and closed notes. • You have one week after the midterm grade is posted to contact your instructor before all grades are final.
Project	20 %	• Your project will build on the assignments you have completed and will consist of a recorded presentation/demo (5%), a poster session (5%), and a final report (10%). • All project deliverables must be submitted on time, otherwise you will lose 1 point per minute.
Participation & engagement	10%	• Participation is assessed through group presentations in class (5%) and ongoing class engagement (5%)

This course relies on active in-class discussion and critique of interactive systems, as a result, attendance and participation are tracked. You are encouraged to bring your laptop with you to class for these activities.

Course policies

Communication

- Please ask all questions related to lecture material, course policies, assignments, midterms, and the project using the appropriate discussion forums on Brightspace
- You can also attend TA student hours to ask questions or discuss further
- Email your TA if there is a matter related to an assignment grade; please do not post these to a forum. The course instructor must be cc'd on all emails addressed to TAs.
- Any deferral requests (see Deferral section) should be communicated by email to the course instructor.
- Email your instructor in the case of confidential information or personal matters.

Deferral

As per Carleton University policies, if you have extenuating circumstances that temporarily prevent you from completing an assignment, you can fill in the Academic Consideration for Coursework Form. You must do this within 24 hours of the deadline AND email the course instructor within that time. Requests are not automatically approved, and the form of academic consideration will depend on the affected assessment and circumstances. If you are sick or have personal circumstances (e.g., death in the family) that prevents you from doing the Midterm, you will also need to fill in the form. If you do not have a valid excuse for missing the Midterm, your grade of zero will be kept.

Note that the Academic Consideration for Coursework Form should only be used for short-term concerns (less than five days) and can only be used once in the course. If you are experiencing longer-term, chronic, or ongoing challenges (including situations where you miss the midterm, you must fill out a Long Term Academic Consideration Form, submit supporting documentation, AND contact the course instructor. These situations will be dealt with on a case-by-case basis. For such cases, you may also want to consider reaching out to the Paul Menton Centre and/or the Care Support team (see the University Policies section).

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.

Academic integrity

- Assignment 1 is an individual assessment and must be your own work. Assignments 2-4 and the final project are completed in assigned teams. Collaboration is expected within your teams for team assessments, but prohibited outside of it unless explicitly authorized. Every team member must understand and be able to explain all submitted team work. Individual grades on team assessments may be adjusted for substantially unequal contribution.
- Cheating during a midterm is strictly prohibited, where cheating includes copying another person's work during the exam, sharing your work with another person during the exam, discussing with another person during the exam, not stopping when time is up, not following exam instructions, or in any way conspiring to get a grade in a dishonest way
- You cannot post questions/answers online (to sites like Chegg, CourseHero, etc.). You are never permitted to share or upload course materials without explicit permission from your instructor.
- Use of any generative AI to generate assignment/project material will be considered academic misconduct. This includes, but is not limited to, chatbots (e.g., ChatGPT, Google Gemini,

Claude), research assistants (e.g., Elicit), and image generators (e.g., Stable Diffusion, Dall-E), etc. An exception to the above rule is made for automated grammar and punctuation checking tools (such as Grammarly).

- References to any material you use but did not originate must use the IEEE/APA/MLA citation style. Failure to reference materials correctly or copying exact wording from online sources can result in severe penalties, and the use of manufactured (i.e., falsified) or misleading references will be treated as evidence of plagiarism and considered academic misconduct.
- All cases of plagiarism or cheating will be pursued through official university channels. Academic integrity offences are reported to the office of the Dean of Science. Penalties for such offences can be found on the Faculty of Science academic integrity webpage. You can also check the official university policies on academic integrity. If you are unsure of the expectations regarding academic integrity, please ask your instructor.

Electronic Devices and Smart Glasses during Tests

All quizzes, tests and exams are expected to be completed individually, and without electronic aid; any communication or access of electronic devices (e.g. cellphones) during the test will be considered cheating. Use of Smart Glasses (or other similar assistive technologies) before or during a test is strictly prohibited and is considered an academic integrity violation. Even if you have prescription glasses with assistive technologies, you will not be allowed to use them during the test, so please make sure that you have acceptable prescription glasses. The proctor has the right to ask to inspect your glasses before or during the test. In addition, unless authorized with PMC accommodations, you are NOT allowed to use headphones nor ear buds during a test. Also, during a test, if you choose to wear a baseball cap, sunglasses or anything else that would prevent a proctor from monitoring where your eyes are focused during the test, you will likely be asked by a proctor to move to a different seat. Lastly, you must submit your test before leaving the classroom or it won't be graded.

Respect and Inclusion

The course instructor and TAs in this course are committed to fostering a learning environment that is inclusive for everyone. All students in the class, the instructor, TAs, and any guests should be treated with respect during all interactions, including any communications in class, through email, during student hours, or on any forum. Please feel free to contact your instructor via email or in person if you have any experiences in this class that made you feel uncomfortable.

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.

School of Computer Science policies

Laptop policy

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 advisor

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/.

University policies and resources

Land acknowledgement

Here at Carleton University, it is important that we acknowledge that the land on which we gather is the traditional and unceded territory of the Algonquin nation.

University dates and deadlines

For information about Carleton's academic year, including registration and withdrawal dates, see Carleton's Academic Calendar.

Grading

In accordance with the Carleton University Undergraduate Calendar Regulations, the letter grades assigned in this course will have the following percentage equivalents:

A+ = 90-100	B+ = 77-79	C+ = 67-69	D+ = 57-59
A = 85-89	B = 73-76	C = 63-66	D = 53-56
A- = 80-84	B- = 70-72	C- = 60-62	D- = 50-52

F = <50

WDN = Withdrawn from the course; DEF = Deferred ; FND = (Failed, no Deferred)

Mental health and wellness

The Carleton Wellness Website has many resources to help support you during your time at university. Consider using these resources to help you manage your mental health.

Accommodations

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/).