COMP 2402AC (Fall, 2025) **Abstract Data Types and Algorithms**

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Office Location: HP5270

Best Ways to be in Touch:
In class, office hours, via email.

Class Location: Please check Carleton Central for the room location.

Section A: Wed & Fri, 14:35 – 15:55 (In-person)

Section C: Tue & Thur, 16:05 – 17:25 (In-person)

Course Website: Brightspace

Coordinator: Farah Chanchary (she/her) **Email:** farahchanchary@cunet.carleton.ca
Teaching Assistants (TA) list: A list of TAs and their contact info will be posted on Brightspace once the course begins.
Office Hours: TA and instructor office hours will be available on Brightspace at the start of the course.
Important dates and deadlines can be found here: Registration Dates, including class suspension for fall, winter breaks, and statutory holidays.

Course Information

This course builds upon the principles introduced in COMP 1405 and COMP 1406 and provides a general background for further study in Computer Science. The course will cover object-oriented programming concepts; the design and implementation of data structures (linked lists, stacks, queues, trees, heaps, hash tables, and graphs) and related algorithmic techniques (searching, sorting, recursion); and algorithm analysis. Students will be expected to complete a number of programming projects using the concepts presented.

Precludes additional credit for COMP 2002 (no longer offered), SYSC 2002 (no longer offered), and SYSC 2100.
Prerequisite(s): one of COMP 1406, COMP 1006, with a minimum grade of C-.
Postrequisite(s): A minimum grade of C- in COMP 2402 is required to take the postrequisite course. The course list can be found at the Carleton University Calendar.

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

Textbook: Students are not required to purchase textbooks or other learning materials for this course. We will use Professor Pat Morin's *Open Data Structures*. Free PDF and HTML versions of the book are available here. We will use the Java version.

Brightspace: This platform will be used during the course to share materials, post tutorials, weekly updates, and etc.

Laptop Requirement (School of Computer Science) :
Every student that has been enrolled in a 1000-level (i.e., first year) course offered by the School of Computer Science after the 2020/2021 school year is required to have a laptop. For more information, please visit SCS Laptop Requirement and then review the requirements at Laptop Specifications.

Necessary Software:
There will be a lot of **Java programming** throughout the course. You will need a Java compiler and your favourite editor. If you do not have Java installed on your computer, you can download it free from Oracle Java.

Topics Covered and Learning Outcomes

Topics Covered

Throughout this course, students will explore foundational topics in abstract data types and algorithms, including:

- **Interfaces and Implementation (The Java collections Framework)**
- **Sequences: lists, stacks, queues, deques**
- **Array-based and linked-list-based implementations of sequences**
- **Unordered sets - hash tables**
- **Ordered sets - balanced search trees, skiplists**
- **Priority queues - heaps**
- **Sorting algorithms**
- **Graphs**
- **Applications of data structures**
- **Performance issues**

Learning outcomes

By the end of this course, students who actively participate in lectures, tutorials, and assignments will be able to:

- Discuss basic types of data structures, their implementation, application, strengths, and weaknesses.
- Analyze the pros and cons of various solutions to a given problem and decide which code is best for the given situation.
- Design better code (efficient, reliable, fast, and elegant), leading to software that runs faster and consumes less memory.

A detailed breakdown of topics and a tentative calendar are available on the course website.

Assessment Scheme

Grade Breakdown

COMPONENT	GRADE VALUE	DATE
Weekly Quizzes 1-11	15 %, best 9 out of 11	**23:59 on Fridays**
Assignment 1-5	40 %, best 4 out of 5	**23:59 on Fridays**
Midterm (In-Person)	15 %	**TBD by Carleton between** October 27-31 (2h)
Final Exam (In-Person)	30 %	**TBD by Carleton between** December 8-20 (2h)
Bonus (Optional)	5 %	

Lectures:

This course will be delivered **in person**. You are strongly encouraged to attend lectures regularly, as I believe in-person learning is a more engaging and effective way to understand the material. **All relevant course materials**, including lecture slides, solutions, and weekly updates, **will be posted after the lectures.**

Weekly Quizzes:

To test your understanding of each topic we covered during the lectures, weekly quizzes will be available on Brightspace. Each quiz consists of a small number of topic-specific multiple-choice questions. All quizzes are untimed and will remain accessible for several days. You are **allowed—and encouraged—to make multiple attempts** within the week. Your highest score will be recorded to keep the assessment low-stakes and aligned with the goal of reinforcing learning through repetition. You will need to **submit your quiz** on Brightspace before the associated due dates to get the marks. **There are 11 quizzes total, but your grade will be based on the best 9.** Up to 2 extra marks may count as a bonus.

Assignments:

Assignments are designed to offer you hands-on practice with course topics. Some questions may be challenging, but you are encouraged to make full use of the available resources. Teaching Assistants and I are here to help —please make use of their office hours as needed. **While collaboration with peers is welcome, you must formulate and write your solutions independently**. Guidance regarding outside sources on **academic integrity.**

Assignments will be announced and available on Brightspace. **They must be submitted electronically before the due date.** Make sure you submit your assignment ahead of the deadline in case of any tech issues with Brightspace. You have multiple chances to resubmit the work, and the latest one will be for marks. **It is your responsibility to ensure that your solutions are submitted in a readable format before the deadline.**

No submissions will be accepted after the due dates, as grading will begin. Do not email your assignments to the instructor or TAs. Consequently, you are advised to periodically upload your progress and/or attempt to submit your final submission at least one hour in advance of the due date and time. Submission of the coursework is handled electronically(i.e., through a submission server). Once the server closes at the specified deadline, any unsubmitted work will be considered late and will receive a grade of zero.

Midterm & Final Test:

The midterm and final exam will take place in person, scheduled by Carleton. Additional details about each test will be posted on Brightspace at least one week in advance. The midterm might be scheduled outside of regular class hours and could occur on a Friday evening, Saturday, or Sunday. You are **not required to pass the midterm or final test** to pass the course; however, failure to complete them will result in a score of zero.

Marking Issues:

It is your responsibility to ensure that your assignment marks posted to Brightspace are correct, and you must do so within **one week** of the date the marks were released.

1. First, contact the teaching assistant who graded your work.
2. If there is still an issue, contact the lab coordinator with the student's and TA's documented email history.
3. If you still have a grading dispute, please contact me with the communication history between the student, TA, and lab coordinator. Note that if I need to regrade your work, the grade may increase or decrease.

After that one week, no further consideration will be offered, and any student requests to correct or revise marks will not be accepted.

Important Considerations:

The grading scheme will remain unchanged under any circumstances, which means I **cannot** shift the weights of tests, tutorials, or assignments. **No make-up assignments or tests will be provided.** Since assignments and quizzes are made available well in advance of their deadlines, **illness does not excuse a student from completing a quiz and/or assignment.** However, students are invited to discuss any concerns with me **at the earliest opportunity.**

The use of any AI system will be considered academic misconduct. Many of the assessed activities in this course were designed to be completed by an individual working alone. Unless it is explicitly stated otherwise, the use of any AI system will be considered academic misconduct. This includes, but is not limited to, chatbots or code generators (e.g., ChatGPT, Google Gemini, Microsoft Copilot), 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).

Doing well in this course is not only about getting a high grade. It means you really understand the material, and you can connect it with what you have learned before and what you will learn in the future. It is normal to feel uncomfortable when learning something new. But if you can try to challenge yourself a little, instead of always looking for answers directly from AI, you will improve much more. **Real understanding comes from your own thinking and effort.**

In addition to the time spent attending lectures, students can **expect to spend at least nine (9) hours per week** on this course. **Students are responsible for all course materials.** All materials created for this course (including, but not limited to, lecture notes, in-class examples, exercises, assignments, examinations, and posted solutions) remain the intellectual property of Prof. Mao.

These materials are intended for the personal and non-transferable use of students registered in the current course offering. Reposting, reproducing, or redistributing any course materials, in part or in whole, without the written consent of the instructor is strictly prohibited.
Students are asked to pose all questions related to course content using Brightspace. Students must **avoid emailing the instructor directly** unless the question contains confidential or personal information.

The instructor will attempt to answer every student's email received **within three business days** of receiving the message, unless the email requests information already posted on the official discussion boards or as an announcement or in the course outline. **To ensure that all announcements are received, students are expected to check their email on a daily basis.**

Sharing quizzes, assignments, tests specifications or posting them online (to sites like Chegg, CourseHero, OneClass, etc.) is always considered academic misconduct (at any time, even after the course has concluded). You are only permitted to post, share, or upload course materials (even for portfolio purposes) if you receive explicit permission from your instructor. Academic integrity offences are reported to the office of the Dean of Science. Information, processes, and penalties for such offences can be found on the ODS webpage: Academic Integrity

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.

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: Computer Laboratories. All SCS computer lab and technical support information can be found at: Technic Support. Technical support staff may be contacted in-person or virtually, see this page for details: Contact IT Support.

Mental Health and Wellness

If you are struggling, please do not hesitate to reach out. I am happy to listen, and/or direct you to resources that might help. If you need extra help with course content or happen to miss a class, there's no need to worry—materials will be posted on Brightspace, and I'm happy to arrange additional office hours beyond the scheduled time to help you catch up. Remember that Carleton also offers an array of mental health and well-being resources, which can be found on the Carleton Wellness Website.

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/).

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 office 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.