Course Outline
COMP2402 – Abstract Data Types and Algorithms

Description

Introduction to the design and implementation of abstract data types and to complexity analysis of data structures. Topics include: stacks, queues, lists, trees and graphs. Special attention is given to abstraction, interface specification and hierarchical design using an object-oriented programming language.
Prerequisite(s): (COMP 1006 or COMP 1406) with a minimum grade of **C-**.

Course Information

Instructor	**Andrew Runka**
Contact	arunka@scs.carleton.ca
Office	HP 5368
Lectures A:	Tue/Thu - 4:05p-5:25p
Lectures B:	Tue/Thu - 1:05p-2:25p
	Room location is posted on Carleton Central
Lab/TA Co-ordinator	**Farah Chanchary (FarahChanchary@cunet.carleton.ca)**
Course Website	https://brightspace.carleton.ca/
Course Forum	Discord server (link is available in brightspace)

Topics Covered

Below is a summary of topics the course will cover:
- The Java Collections Framework
- Sequences: Lists, Stacks, Queues, and Deques
- Array-based and linked-list implementations
- Unordered Sets – Hash tables
- Ordered Sets – Search Trees, Skiplists
- Priority Queues – Heaps
- Sorting Algorithms
- Graphs

A tentative calendar of topic coverage is available on the course website.

Learning Outcomes

By the end of this course, successful students will have demonstrated their ability to build modern full-stack web applications. They 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 structure is best for the given situation.
- Design better code (efficient, reliable, fast, and elegant), leading to software that runs faster and consumes less memory.

Course Delivery

Lectures will be provided in person. Lectures will be accompanied by **slides, code examples, and assigned readings**. **Supplementary asynchronous online videos** may be made available on the course Brightspace.

Course Outline – Last modified 2025-12-18

Our course website is hosted on **Brightspace**. Content including lecture notes and assignments will be hosted here. Students are required to be familiar with everything posted there. It is recommended to check our course website at least three times a week.

We will use **Discord** as our course forum. Students will be required to use an alias that includes their first and last name, as listed on Brightspace.

Textbook

Course textbook is Open Data Structures (in Java) by Pat Morin. Click the link for access to this free resource. **Students are not required to purchase textbooks or other learning materials for this course.**

Necessary Equipment and 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.

Every student enrolled in a course offered by the School of Computer Science is expected to have their own laptop computer. For more information, please visit SCS Laptop Requirement and then review the requirements at Laptop Specifications.

Assessment Scheme

Your performance in this course will be assessed using several components:
- There are **5 programming assignments**. Electronic submission enforces strict deadlines. No late assignments are accepted. Do not email your assignments to the instructor or TAs.
- There are **11 weekly quizzes** to evaluate your understanding of the course material. Quizzes will be taken online via Brightspace. There are 11 quizzes, but only the **best 10 will count** towards your final grade.
- There is an in person **midterm**, that will be written during regularly scheduled lecture.
- There is a mandatory **final exam** which will be scheduled by the university later in the semester.

The grades you achieve on these components will be weighted using the following scheme:

Component	Quantity	Weight	Total Weight	Dates
Assignments	5	5% each	25%	See Brightspace
Quizzes	Best 10 of 11	1% each	10%	Weekly, online
Midterm	1		25%	In person, tentatively Feb26th
Final Exam	1		40%	Formally schedule exam, TBA

This grading scheme will not be changed or adjusted under any circumstance. No make-up assignments or test will be provided. A calendar of course due dates will be posted to Brightspace. 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**. Other important dates and deadlines can be found here, including class suspension for fall, winter breaks, and statutory holidays.

Assignment Policies

- Assignments will be announced and available on Brightspace.
- Assignments will be submitted through an auto-grading submission server.
- Do not email your assignments to the instructor or TA, they will not be graded.
- **No late assignments will be accepted**.
- You have multiple chances to resubmit your work, and the highest mark will be kept.

- The submission server may experience considerable load near the deadline, which may affect outcomes. **Do not wait until the last minute to begin your assignment.**
- Last minute issues such as loss of internet connection or illness on the due date will not be accommodated.
- Any work submitted for grading must be your own individual and original work, unless stated otherwise.
- All assignments will be counted towards your final grade, and no extra credit assignments will be provided.
- You should take the time to ensure that assignments are neat, legible and easy to understand.
- Submitting the wrong file or failure to correctly submit your work will result in a mark of zero for that assignment.
- If any instructions are unclear, please ask for clarification. Incorrect assumptions or misunderstood directions will not be accepted as valid excuses. It is your responsibility to ensure you understand the question(s) completely.
- Any accommodations should be requested as soon as the issue arises, **no accommodations will be made after the deadline**.
- It is your responsibility to ensure that your assignment marks posted to Brightspace are correct.

Weekly Quizzes

Weekly quizzes will be available on Brightspace, testing the topics covered during that week's lectures. 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, in order to keep the tests low-stakes and aligned with reinforcement of course topics.

You will need to submit an attempt at the quiz before the associated due dates to get the marks. The best **10 of 11** quizzes will be counted towards your final grade. **No deferred quizzes will be given**.

These quizzes are expected to be completed individually, and without electronic aid; any communication or access of electronic devices during the quiz will be considered cheating.

Midterm

The midterm exam will take place in person during regularly scheduled lecture time. You are required to attend and write the midterm in order to receive credit. If you are unable to attend the midterm due to illness, please contact your instructor BEFORE the date/time of the midterm. You will be required to fill out the Carleton Academic Consideration form . A deferral may or may not be granted, at the sole discretion of the instructor. If a midterm deferral is granted it may take place in the evening or on a weekend. **No accommodations will be provided after the midterm date has passed.** Additional details regarding the format and date of the midterm will be announced after the beginning of class.

Final Exam

The time and place, as well as the format of the final exam will be announced later in the term. Do not make travel plans until the dates are known as no advance exams will be given. The exam period can be found at http://carleton.ca/registrar/registration/dates-and-deadlines/. The deferral process for formally scheduled exams is handled through the registrar's office, see the registrars website for more details. There is no double pass rule in effect, however failure to complete the exam will result in a grade of zero.

Lab/TA Co-ordinator

We have a lab/TA coordinator assigned to this course offering. The lab coordinator is responsible for organizing and overseeing the course's tutorial sections and imposing submission rules to help ensure that marking goes smoothly. The lab coordinator is also responsible for distributing assignments to teaching assistants for marking. If you are missing an assignment grade or are unsure about the status of your assignment, you can contact the lab coordinator.

Academic Integrity & Collaboration Policy

Although sharing of ideas among peers is encouraged, sharing of solutions, source code, plans, or any portion of gradable material is prohibited. **Collaborating on quizzes, tests, assignments or final exams is strictly disallowed.** You must complete the work by and for yourself. You are never permitted to copy (or copy and modify) solutions (even if incomplete) from anyone or from the Internet. If you need help please use the course forum, see a TA, or contact your instructor.

Any coursework that you submit for grades must be your own original solutions developed specifically for the currently registered course offering. Any work submitted that does not meet this description will be considered an act of plagiarism. To ensure that no instances of academic misconduct have been committed, electronic tools may be used to analyze and compare submissions.

The use of artificial intelligence tools (e.g. ChatGPT, Copilot, etc.) to generate code or other solutions to graded assessments is strictly prohibited in this course. Any work submitted for grades that has been generated by such tools will be considered an act of plagiarism.

Please note, that it is also a serious offense to aid another student in committing plagiarism. This includes (but is not limited to): sharing source code or other assignment, test, or tutorial solutions in part or in full, in person or in posting whether on the course forum, github or other online source repository, hallway noticeboard, or elsewhere. You are NEVER permitted to post, share, or upload course materials or your course work without explicit permission from your instructor

For more information regarding Academic Integrity at Carleton including the policies, best practices, and the standard sanctions for misconduct, please visit the Faculty of Science website.

Copyright & Fair use of materials

All materials created for this course (including, but not limited to, lecture notes, in-class examples, tutorial exercises, assignments, examinations, and posted solutions) 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, or person with interest in using the material for the purpose of their own learning. Reposting, reproducing, or redistributing any course materials, in part or in whole, without the written consent of the instructor, is strictly prohibited.

Electronic Communication

To ensure that all course announcements are received, **students are expected to check their Carleton email on a daily basis.**

Students are asked to pose all questions related to **course content** using the official **course Discord server**. Questions regarding the marking of your test/assignment should be directed to the individual who marked it. If your question is private or individual in nature please do not hesitate to contact the TAs or instructor via email. In order to ensure accuracy and accountability, *all* requests for course accommodations must be done via email to the instructor.

Emails to the TAs or instructor **must include the course name in the subject line.** If your email is in regards to a tutorial, you should also include your tutorial section in the subject line. E.g.: Subject: [COMP 1001] Please Help." Failure to do so may result in delays in response times or your message being missed completely. The instructor will attempt to answer every course-related email within 2 business days of the time it is received.

SCS Computer Laboratory

SCS students can access one of the designated labs for your course. The lab schedule 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/technical-support/. Technical support is available in room HP5161 Monday to Friday from 9:00 until 17:00 or by emailing SCS.Tech.Support@cunet.carleton.ca.

Undergraduate Academic Advisor

The Undergraduate Advisor for the School of Computer Science is available in Room 5302C HP; 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.

University Policies

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

Academic 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, including information about the Academic Consideration Policy for Students in Medical and Other Extenuating Circumstances, are outlined on the Academic Accommodations website: https://students.carleton.ca/course-outline/.

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 sanctioned with penalties which range from a reprimand to receiving a grade of F in the course, or even being suspended or expelled from the University. Examples of punishable offences include plagiarism and unauthorized collaboration. Any such reported offences will be reviewed by the office of the Dean of Science. More information on this policy may be found on the ODS Academic Integrity page: https://carleton.ca/registrar/academic-integrity/.

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. More information and standard sanction guidelines can be found here: https://science.carleton.ca/students/academic-integrity/.

Unauthorized 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".

Use of AI Systems (e.g., ChatGPT, etc.). Many of the assessed activities in this course were designed to be completed by an individual student working alone. Unless it is explicitly stated otherwise, the use of any AI tool to complete work will be considered academic misconduct. This includes, but is not limited to, chatbots (e.g., ChatGPT, Google Bard, Bing Chart), research assistants (e.g., Elicit), and image generators (e.g., Stable Diffusion, Dall-E), etc.

Students are invited to discuss any concerns with the instructor at the earliest opportunity.