



Advanced Data Structures

Course Information

Course Number: COSC2P03

Term/Year/Duration: Fall 2024

Instructor Information

Instructor, Section 1: Sheridan Houghten

Email: shoughten@brocku.ca

Office: J313; office hours Tue 1pm-2pm

Instructor, Section 2: Yifeng Li

Email: yli2@brocku.ca

Office: J322; office hours Thu 10am-11am

Course Coordinator: Brendan Park

Email: bpark@brocku.ca

Times and Locations

Section 1 Lecture: Thursdays, 8am–11am, STH216

Section 2 Lecture: Tuesdays and Thursdays, 2pm–3:30pm, TH243

Labs: J301

Tutorial: Fridays, 9am–10am, Online (using TH325 for term test only)

Note: Classes at Brock University end ten minutes ahead of the hour or half hour to facilitate transfer time.

All lectures are delivered in-person, synchronously. A Student may make or share an audio or video recording of a lecture, presentation, or lesson, **only with the permission of the instructor**. Kindly refer to the university's Academic Integrity policy.

Course Calendar Description

Implementation and use of advanced data structures including trees, graphs, hash tables and advanced list structures, sorting and searching, recursion and traversals. Analysis of algorithms.

Learning Outcomes:

- Asymptotic complexity analysis; comparison of run time and space requirements of algorithms
- Design and selection of suitable data structures according to differing goals and priorities
- Representation and implementation of graphs; and related algorithms
- Developing both theoretical and practical understanding of competing abstract data types

Topic Overview

- Introduction — including recursion and complexity
- Stacks and Queues, Priority Queues
- Trees
- Heaps
- Advanced Sorting
- Graphs
- Hashing

Textbook

Data Structures and Algorithm Analysis in Java, 3rd Edition, Mark Allen Weiss

Course Communications

All official correspondence — including class cancellations, updates to assignments, inclement weather, deadlines, etc. — will be posted to Brightspace, with some notices replicated to your email. All students are expected to check both regularly, and may be assumed to have read anything posted to either.

Your **first** point of contact for all matters related to assignments, delivery of the course, etc. is the course coordinator. Your instructor will not override a TA or marker if you skip this step.

Both instructors have posted office hours. In the case that a student is unable to attend during the posted times, you should email the instructor to make an appointment.

All emails must be sent from your official **Brock** email address, and must include **COSC2P03** *in the subject line*. Replies will not be sent to any correspondence choosing to skip these minimal requirements.

Assessment and Dates

	Grade Weight	Due Date
Assignment 1	6%	27 th September
Assignment 2	9%	11 th October
Assignment 3	9%	8 th November
Assignment 4	6%	29 th November
Lab 1	2%	Week of 16 th September
Lab 2	2%	Week of 30 th September
Lab 3	2%	Week of 21 st October
Lab 4	2%	Week of 11 th November
Lab 5	2%	Week of 25 th November
Midterm	20%	1 st November
Exam	40%	(TBA by registrar)

Late Submission Policy

Outside of accommodations (medical, compassionate, etc.) and arrangements *made in advance*, late submissions **are not accepted**. Common issues, such as leaving insufficient time to upload files, slow internet, etc. are easily anticipated, and easily avoided; and **not** grounds for exception. Accordingly, no such requests will receive a reply.

For medical accommodations, refer to the Medical Exemption Policy and the medical health certificate at the [Registrar's Website \(Forms\)](#).

Important dates for Fall 2024 (D2)

The most recent listing of Important Dates for all durations is at <https://brocku.ca/important-dates/all/>

First day of classes: 4th September

Last day of lectures: 3rd December

Reading Week: 14th – 18th October

Last Day of Exams: 19th December

Deadline for withdrawal without academic penalty: 5th November.

Relationship between attendance and grades:

Students are expected to attend all classes and scheduled labs.

Labs

There are five instructional labs. These are scheduled in the weeks that start on the following days: 16th September, 30th September, 21st October, 11th November, 25th November.

For these five labs, attendance is taken and a grade is assigned based on the work completed in the lab. Mere attendance and minimal effort in the lab will only merit a mark of at most 50% in that lab. To obtain the full marks available you must show your completed work to the TA.

You must attend the lab for which you are registered.

In all other weeks (starting from the week of 23rd September), a TA will be available in the lab to answer programming questions during the lab, but in these other weeks no attendance will be taken and no grade will be assigned.

Tutorials

Tutorials start on 13th September and will be held online weekly on Teams during the scheduled time, with the exception of Friday, 1st November during which the midterm test will be held in TH325.

A TA will be available to answer questions during these tutorial times. Due to the nature of the tutorial, the questions should be limited to class material rather than detailed programming questions. Attendance is not taken.

Requirements for credit:

The final exam is an integral component of assessment; students must earn a 40% on the final exam in order to qualify for a credit in the course.

Assignment standards:

Assignments explore and reinforce concepts taught in class. It is expected that students will follow instructions and submit cogent and sensible works. If the marker, instructor, or course coordinator encounters anything confusing and emails a student questions, that student has three **calendar** days to reply, or the work will be simply assigned a zero. It is your responsibility to ensure your submission can be understood by those evaluating it, and nobody else will put more effort into making sense of it than you do.

Academic Policies

Academic Integrity

Academic misconduct is a serious offence. The principle of academic integrity, particularly of doing one's own work, documenting properly (including use of quotation marks, appropriate paraphrasing and referencing/citation), collaborating appropriately, and avoiding misrepresentation, is a core principle in university study. Students should consult Section VII, "Academic Misconduct", in the "Academic Regulations and University Policies" entry in the [Undergraduate Calendar](#) to view a fuller description of prohibited actions, and the procedures and penalties. Information on what constitutes academic integrity is available at [Brock University Academic Integrity Website](#).

Students are reminded that any form of distribution or upload of Brock material is an offense, subject to an Integrity hearing.

In the event of any form of penalty imposed by the Dean's office for misconduct, offenders will be ineligible for any curving, shifting, or other academic consideration (as that would countermand prescribed penalties).

Plagiarism detection software:

Phrase-matching, similarity-detection, and related software may be used to inspect any and all assignments. All tools store all content local to Brock's facilities, so there is no opt-out available.

Penalties for Academic Misconduct in the Faculty of Mathematics and Science

The following are standard penalties imposed in academic misconduct cases in FMS. Please be aware that the Associate Dean, Undergraduate Programs, may assign different penalties than those listed here, depending on the details of individual cases. ***Requests for special academic consideration, such as exceptions to academic regulations, will not be considered while academic integrity cases are ongoing.***

Penalties for misconduct in course work, including mid-term tests

First offence: Zero grade on assignment, additional penalty of 100% of the weight of the assignment to be subtracted from the final grade, mandatory completion of the AZLS Academic Integrity workshop

Second offence: Zero grade on assignment, 4-month suspension

Third offence: Zero grade in course, 1-year suspension, permanent removal from major program.

Fourth offence: Permanent suspension / debarment.

Penalties for misconduct in final exams:

First offence: Zero grade in course

Second offence: Zero grade in course, 4-month suspension

Third: Zero grade in course, 1-year suspension, permanent removal from major program,

Fourth offence: Permanent suspension / debarment.

Intellectual Property Notice

All slides, presentations, handouts, tests, exams, and other course materials created by the instructor in this course are the intellectual property of the instructor. A student who publicly posts or sells an instructor's work, without the instructor's express consent, may be charged with misconduct under Brock's Academic Integrity Policy and/or Code of Conduct, and may also face adverse legal consequences for infringement of intellectual property rights.

It is *additionally* a misuse of computing resources, and separate from any academic misconduct hearing, such misuse will result in the **immediate** disabling/removal of Brightspace presence, and ineligibility to access any other course materials. This includes uploading to online services (Coursehero, Chegg, etc.), as well as any AI assistant (ChatGPT, Copilot, etc.); irrespective of what you do with the result.

Accommodations

The University is committed to fostering an inclusive and supportive environment for all students and will adhere to the Human Rights principles that ensure respect for dignity, individualized accommodation, inclusion and full participation. The University provides a wide range of resources to assist students, as follows:

- a) If you require academic accommodation because of a disability or an ongoing health or mental health condition, please contact Student Accessibility Services at askSAS@brocku.ca or 905 688 5550 ext. 3240.

- b) **Medical Self-Declaration Forms (brief absence up to 72 hours)**

In the case of a short-term medical circumstance, if a student wishes to seek an academic consideration, please use the [Medical Self-Declaration Form](#). The request is to be made in good faith by the student requesting the academic consideration due to a short-term condition that impacts their academic activities (e.g., participation in academic classes, delay in assignments, etc.).

The period of this short-term medical condition for academic consideration must fall within a 72-hour (3 day) period. The form must be submitted to the instructor either during your brief absence or if you are too unwell, within 24 hours of the end of your 3 day brief absence.

Medical Verification Form (extended duration)

In cases where a student requests academic consideration due to a medical circumstance that exceeds 72 hours (three days) and will impact their academic activities (e.g., participation in academic classes, delay in assignments, etc.), or in the case of a final exam deferral, the [medical verification form](#) must be signed by the student and the health professional as per process set out in the [Faculty Handbook III:9.4.1](#).

- c) If you are experiencing mental health concerns, contact the Student Wellness and Accessibility Centre. *Good2Talk* is a service specifically for post-secondary students, available 24/7, 365 days a year, and provides anonymous assistance: [Good 2 Talk](#) or call **1-866-925-5454**. For information on wellness, coping and resiliency, visit: [Brock University \(Mental Health\)](#)
- d) If you require academic accommodation on religious grounds, you should make a formal, written request to your instructor(s) for alternative dates and/or means of satisfying requirements. Such requests should be made during the first two weeks of any given academic term, or as soon as possible after a need for accommodation is known to exist.

- e) If you have been affected by sexual violence, the Human Rights & Equity Office offers support, information, reasonable accommodations, and resources through the Sexual Violence Support & Education Coordinator. For information on sexual violence, visit [Brock's Sexual Assault and Harassment Policy](#) or contact the Sexual Violence Support & Response Coordinator at humanrights@brocku.ca or 905 688 5550 ext. 4387.
- f) If you have experienced discrimination or harassment on any of the above grounds, including racial, gender or other forms of discrimination, contact the Human Rights and Equity Office at humanrights@brocku.ca.