

CSC263H1S: Data Structures and Analysis

Winter 2024

Syllabus and Information Sheet

Contact Information

Instructor: Professor Bahar Aameri
Email: csc263-2024-01@cs.toronto.edu
Office Hours: See Quercus

Lectures Time and Location:
L0101, MW 12-1pm, RW 110
L0301 T 1-2, NL6, Th 1-2 BA1130

Instructor: Professor Marsha Chechik
Email: csc263-2024-01@cs.toronto.edu
Office Hours: See Quercus

Lectures Time and Location:
L0201 T Th 9-10 MP 103
L5101 Th 6-8 pm BA 1130

Tutorial Time and Locations:

TUT0101 F 12-1 BA1200	TUT0201 F 1-2 BA1190
TUT0102 F 12-1 GB244	TUT0202 F 1-2 ES B142
TUT0103 F 12-1 ES B149	TUT0203 F 1-2 SS 2127
TUT 0104 F 12-1 MP137	TUT0204 F 1-2 SS2110

Course website:

All course material, including lecture slides, will be posted on Quercus.

All announcements will be made through Quercus and/or Piazza, and it is your responsibility to check them regularly.

Course Overview

Outline The course will cover the following subjects:

- Complexity Measures, Worst-case and Average-case Running Time, Amortization
- Priority Queues, Heaps.
- Dictionaries, Balanced Search Trees, Hash Tables.
- Disjoint Sets.
- Randomized Algorithms
- Graphs, BFS and DFS Algorithms, MSTs

Prerequisites: CSC236H1/CSC240H1; STA237H1/STA247H1/ STA255H1/ STA257H1
The prerequisite requirement is strictly enforced in this course.

Learning Outcomes: By the end of this course, students will be familiar with a variety of standard, complex data structures and abstract data types and standard complexity measures. More specifically, students will be able to:

- choose and/or augment data structures appropriately to solve various problems;
- write algorithms that employ standard and/or augmented data structures;
- recognize when each complexity measure is most appropriate;
- analyze the efficiency of algorithms using each complexity measure.

How to do well in this course: The key to mastering any subject, especially in theoretical subjects, is to *comprehend* the concepts of the subject, and *practice* applying the concepts.

Due to limited resources, we can provide very few practice problems through the tutorials and assignments. However, depending on your mathematical background, you will need to do extra exercises that are not part of the course work. For extra practice, refer to the suggested textbooks. The following are necessary for doing well in the course, but might *not* be sufficient:

- Attend the *lectures* and *tutorials*, *ask* questions, *participate* in class discussions, and go to *office hours*.
- Read the assigned *readings* after each lecture
- Work on the given exercises *before* the tutorials, show your solutions to the TA, and ask for *feedback*.
- Spend (at least) 8-10 hours/week:
 - 2 hours in lectures
 - 1 hour in tutorial
 - 5-7 hours reviewing slides and course notes, working on tutorial exercises, quizzes and assignments.
- Check the course web page on Quercus and emails *regularly*, pay attention to the course *instructions, policies, announcements* and *deadlines*.

Tutorials and quizzes: There will be weekly tutorial sessions (except during the first week). During each tutorial session, students will work on a set of exercises in groups of 2-3. Exercises for each session will be posted on Quercus a few days before the session. Students are expected to work on the exercises *before* the tutorial and be prepared to correct and/or complete their solutions with the help of the TAs. You are expected to complete a quiz at the ***end of each tutorial*** (or take it home and complete by ***10 p.m. same day***). ***Quiz 0*** is due on the first Friday (***Jan 12***) of the semester and is not based on tutorial material but instead on Week 1 lectures and course prerequisites.

Textbook:

[Required] David Liu's CSC263 Course Notes (available on Quercus)

[Additional information] T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, *Introduction to Algorithms*, 3rd edition, MIT Press and McGraw-Hill, 2009. (E-book available at the UofT library)

Evaluation

Summary The following table summarizes the course-work percentages and due dates

Item	Due Dates	Weight
Assignment #1	January 22, 10pm	4%
Assignment #2	February 5, 10pm	6%
Assignment #3	February 26, 10 pm	6%
Assignment #4	March 11, 10 p.m.	6%
Assignment #5	March 25, 10 p.m.	6%
Assignment #6	April 5, 10 p.m.	6%
Floater	Increased percentage of the best assignment	1%
Survey		1%
Quizzes	10 tutorial online quizzes, each 0.5%, dropping the lowest two	4%
Term Test	Week of Feb 26, outside class, exact date TBD (IMPORTANT: read the instructions below)	20%
Final Exam	TBD	40%

Details

- **6 Assignments:** worth 35% in total.

Assignments are to be completed in groups of no more than **two** students. You can switch partners between assignments. Assignments will be posted on Quercus, *at least two weeks* before the due dates (expect for A1, which will be posted by Jan 12). Start working on them *early*, so that you have an estimate of how much time you need to complete them, and to identify the parts that you need clarification and/or help with. Assignment solutions will *not* be posted, but there will be synchronous online sessions during which sample solutions will be discussed by a TA. The sessions will be recorded.

IMPORTANT: See the “Policies and Other Instructions” section for information about assignment submission, late submission policy, and remark requests.

- **10 quizzes:** worth 4% in total, 8-best quizzes considered in total grade calculation
There will be ten weekly quizzes, due by **Friday, 10pm** of each week (except weeks of Feb 26, Mar 25). The first quiz (Quiz 0) is a review of the course prerequisites. The rest of the quizzes (Quiz 1 to Quiz 9) are directly on the tutorial material covered in the same week. The quizzes are designed so that if you correctly solve all the questions in the tutorial problem set, you will be able to easily get full marks on the relevant quiz. Quizzes will be marked for *correctness*.
- **Mid-Term Test:** The term test is *90-120 minutes*. You will be allowed to bring one *single-sided handwritten 8.5"x11"* aid sheet.

IMPORTANT: If you are unable to attend the term test due to schedule conflicts, submit the *Test Conflict form* (you can find the form link on Quercus). In your request, explain why you cannot attend the test during the scheduled time and include **supporting documents** (e.g., screenshots of your weekly schedule). The **deadline** for requesting the make-up test is **Jan. 26, 2024**.

IMPORTANT: If your request for the make-up test is not approved ahead of the term test, you will **not be permitted** to write the make-up test and will receive zero for the term test.

- **Final Exam:** The final exam is *3 hours* and will cover *all* the topics discussed in the course. To pass the course, students must obtain **at least 40%** on the final exam. You will be allowed to bring one *double-sided handwritten 8.5"x11"* aid sheet.

Policies and Other Instructions

Assignments Submission: Submissions must be *typed* and submitted as PDF files on MarkUs. LaTeX is recommended but *not* required.

Late Work:

Quizzes: Since we are setting aside time for you to complete quizzes during the tutorials, we will not accept any late submissions. However, there are 10 quizzes in total, and we will only count your best 8. If you must skip more than two tutorials due to extraordinary circumstances beyond your control, submit a special consideration request (see the "Special Requests" section below).

Assignments: Each student has 6 (six) grace tokens, each worth a 24-hour extension. You can use these for any assignment, but not more than 2 tokens per any given assignment. Each token is "atomic", i.e., you cannot use $\frac{1}{2}$ token for a 12-hour extension. If a group assignment is late, a grace token is deducted from each group member.

IMPORTANT: The grace token system is designed to provide some flexibility in cases where you require a minor deadline extension *due to extraordinary circumstances beyond your control*. We created this policy because we recognize that unexpected problems, illness, and disability-related barriers sometimes make it difficult to submit assignments on time. However, it's strongly recommended that you do **NOT** use your grace tokens to buy an extension, or you will be out of luck in a true emergency. More specifically, avoid using your grace tokens for reasons such as heavy course load, multiple assignments deadlines or tests in the same week, and catching up on missed work because these circumstances are neither unexpected nor outside of your control. If you constantly find yourself in need of extensions, or have difficulty managing stress and time, either contact the course instructors, or your College Registrar, who can suggest wellness counselling, academic advising, and/or learning strategist services.

Special Consideration Policies: You must use your **grace tokens** in cases where you require a minor deadline extension (2 days or less) due to extraordinary circumstances beyond your control. If you need a major assignment deadline extension (more than 2 days), cannot complete an assignment, or cannot write the term test due to extraordinary circumstances beyond your control, please submit a special consideration request as soon as possible (see the "Special Requests" section below). You must provide documentations supporting your request. You can find the list of acceptable documents [here](#). Special consideration requests will be evaluated on a case-by-case basis and are not granted automatically. Sometimes, we cannot grant you exactly the special consideration you seek.

If you miss an assignment for an approved reason, the weight of the assignment will be shifted to the term test or final exam.

If you miss the term test for an approved reason, you will have the opportunity of writing a make-up test (date and time will be determined by instructors). If you can't attend the make-up test, the weight of the term test will be shifted to the final exam.

Assignment extensions with valid documentation: If you are registered with Accessibility Services, your accommodation letter will allow for an extension of up to 7 full days. You may have another documented emergency warranting an extension. However, if you decide to submit the assignment as a *group*, and the other group member does *not have the same eligibility for extension*, we will normally only grant *half* of your approved extension, rounded up (e.g., if the letter states 7-days of extensions, 4 days will be granted).

Re-marking Requests: If you feel that a piece of your work has been graded unfairly, please submit a written request *within one week of receiving the work back*. Explain your request clearly and briefly and attach the work in question. Remark request for assignments must be submitted through MarkUs. Make sure to read and understand the posted solutions as well as the feedback comments you received for your work before submitting a remark request. All remark requests

will be processed within *one week* after the *remark request deadline* (i.e., *two weeks* after receiving the work back).

Discussion Board: *General* questions about the course organization, material, and assignments should be posted on the discussion board:

<https://piazza.com/utoronto.ca/winter2024/csc263h1s20241allsections/home>

The discussion board will be monitored by the instructors and TAs but can also be used for discussion among students. You may NOT discuss the assignment solutions on the board until *7 days* after the due dates.

Special Considerations: To request special considerations please complete and submit the *Special Considerations form* (you can find the form link on Quercus). We will aim to respond to you within 48 business hours. Make sure to include supporting documentation with your request. Please read the new [Student Absences](#) page from the Faculty of Arts & Science carefully. It contains detailed information on the recognized forms of documentation and the circumstances under which you should use the Absence Declaration tool.

Email Policy: If you have an administrative issue, please message us at the *course email address* above. However, if you have a remark request or special consideration request, it is sufficient to fill out the respective online form. Please avoid sending us an email unless you must provide information that cannot be included in the Special Considerations form. Please use your *university email address* and put “[CSC263]” in the subject line of your emails. Compose a short message and clearly describe a single topic. Email response time may be 2 business days or longer; if you do not hear back as your expectation, come to the weekly office hours of either instructor.

Academic Integrity: Academic integrity is a fundamental principle in higher education. Any breach of academic honesty is a serious academic offence which eventually can affect one’s professional life dramatically. Suspected cases of academic dishonesty will be investigated based on the [University’s Integrity Policies](#), with no exception.

When discussing assignment problems with other groups, do NOT take any notes (paper or electronic) from the discussions. Your submissions must be developed and written solely based on *your own interpretation* of group discussions, otherwise it will be considered as plagiarism. For details on the meaning of plagiarism and how it can be avoided read [this](#) document.

The use of ***generative artificial intelligence (AI) tools*** is **strongly discouraged** in course assignments and quizzes. This includes, but is not limited to, ChatGPT, GitHub Copilot, and open-source models that you have trained and/or deployed yourself. Though it may be tempting to use generative AI to assist you when completing your assignments, this will simply inhibit your learning – and you cannot use generative AI on your term test or final exam! If the work you submit is essentially the output of generative AI, then what have you learned and what value are

you adding? Think of it this way: if a potential employer or supervisor can get as much from an AI tool as what you're able to do yourself, then why should they hire you at all? You should aim to understand course content at a level that far exceeds what an automated tool can achieve. Our course—and in particular, each assignment—is designed to help you attain true mastery of the course content. If you have questions or are stuck, please come to office hours, where we'll be happy to help!