

CSC263H1F: Data Structures and Analysis

Contact Information

Instructor: Bahar Aameri

Email: bahar@cs.toronto.edu

Office Hours:

Thu. 3-6pm, BA2283

Lectures Time and Location:

L0101, L2003: W 12pm-2pm, MC 252

L0201, L2000, L2201: W 3pm - 5pm, WB 116

Tutorials Time and Location:

L0101, L2003: F 10am-11pm, TBA

L0201, L2000, L2201: F 1pm - 2pm, TBA

Course website:

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

All announcements will be made through portal (*Quercus*) and/or course discussion board, 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

Prerequisite CSC207H1; CSC236H1/CSC240H1; STA247H1/ STA255H1/ STA257H1

The prerequisite requirement is strictly enforced in this course.

Tutorials There will be 11 tutorial sessions. 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 the course web page 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 TA.

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

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 only 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. The following are hence 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 exercises and assignments.
- Check the course web page and emails *regularly*, pay attention to the course *instructions*, *policies*, *announcements* and *deadlines*.

Evaluation

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

<i>Item</i>	<i>Due Dates</i>	<i>Weight</i>
Assignment #1	Oct 10, 11pm	10%
Assignment #2	Nov 11, 11pm	10%
Assignment #3	Dec 06, 11pm	10%
Term Test	Oct 26, 5-7pm (IMPORTANT: read the instructions below)	25%
Final Exam	TBD	45%

Details

- **3 Assignments:** worth 30% in total.
Assignments are to be completed in groups of no more than **three** students. Assignments will be posted on Quercus, *at least two weeks* before the due dates. 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 discussed during the lectures and tutorials, but will be posted on the course web page *within one week* after the due dates. See the “Policies and Other Instructions” section for information about assignment submission, late submission policy, and remark requests.

- **Mid-Term Test:** The term test takes 2 *hour*. 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, send a request for writing the make-up test to csc263-2018-09@cs.toronto.edu. 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 **Sep 28**. The **Make-up** test will be on **Oct 26, 7-9pm**.

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. In order to pass the course, students must obtain **at least 35%** 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.

Re-marking Requests If you feel a piece of your work has been graded unfairly, please submit a written request within *two weeks* of receiving the work back. Explain your request clearly and briefly, and attach the work in question. All requests must be submitted to the *instructor*. 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.

Late Work Late assignments will be penalized by 2% for every *hour* of lateness up to *24 hours* after the due date, except for valid and *documented* reasons. Documents for justifying late or missed work must be submitted to the *instructor* as soon as possible.

Discussion Board *General* questions about the course organization, material, and assignments should be posted on the discussion board (<https://piazza.com/utoronto.ca/fall2018/csc263h1>). The discussion board will be monitored by the instructor and TAs, but can also be used for discussion among students. You may NOT discuss the assignment solutions on the board until *48 hours* after the due dates.

Email Policy Please use your *university email address* and put the *course code* in the subject line of your emails. Use email only for *personal issues* such as requesting special considerations. Compose a short message and clearly describe a single topic. Email response time may be 24 hours or longer; if you do not hear back as your expectation, come to the weekly office hours.

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.

Tentative Schedule

<i>Week</i>	<i>Topic</i>	<i>Readings From the Text Book</i>	<i>Important Dates</i>
<i>1</i>	Complexity Review; ADTs	CLRS: 1, 2, 3	
<i>2</i>	Priority Queues; Heaps Dictionaries; Binary Search Trees (BSTs)	CLRS: 6, 12.1, 12.2	
<i>3</i>	Balanced Search Trees (AVL) Augmenting Data Structures	CLRS: 12.3 AVL Trees Notes	A1 out
<i>4</i>	Hashing	CLRS: 11.1 to 11.4	
<i>5</i>	Randomization; Randomized Quicksort	CLRS: 5, 7	A1 due
<i>6</i>	Amortization; Dynamic Arrays	CLRS: 17	
<i>7</i>	Disjoint Sets	CLRS: 21.1 to 21.3	
<i>8</i>	Graphs; Breadth-First Search	CLRS: 22.1, 22.2	Term Test, A2 out
<i>9</i>	Reading Week		
<i>10</i>	Depth-First Search	CLRS: 22.3, 22.4	A2 due, A3 out
<i>11</i>	Minimum Spanning Trees (MSTs)	CLRS: 23	
<i>12</i>	MSTs; Problem Complexity Lower Bounds	CLRS: 8.1	
<i>13</i>	Problem Complexity Lower bounds Review	CLRS: 9.1	A3 due