CSC265: Enriched Data Structures and Analysis

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1 Course Description

This course is an "enriched" version of CSC263 (Data Structures and Analysis). While we cover the same topics, we will go at a faster pace, in greater depth and with more rigour, and with more challenging assignments. Greater emphasis will be placed on proofs, theoretical analysis, and creative problem-solving. Certain topics briefly mentioned in CSC263 may be covered in more detail in this course, and some additional topics may also be covered.

The topics we will cover include:

- Algorithm analysis: worst-case, average-case, and amortized complexity.
- Standard abstract data types, such as dictionaries, priority queues, graphs, and disjoint sets.
- Design and implementation of a variety of data structures for implementing these abstract data types, such as heaps, balanced search trees, hash tables, and disjoint forests.
- Introduction to lower bounds.

2 Lectures, Tutorials, and Office Hours

Course Quercus Page https://q.utoronto.ca/courses/395427

Lectures by Jeremy Ko

- Monday — 3:00 to 4:00 — Room: AB107
- Wednesday — 3:00 to 4:00 — Room: WB219

Tutorials by Jason Liu

- Friday — 3:00 to 4:00 — Room: BA2135

It is mandatory to attend all tutorials. Tutorials will cover new topics that are not covered in lecture, and may be tested in assignments and exams. Tutorials will also give you a chance to solve extra problems.

Office Hours by Jeremy Ko

- Monday — 4:00 to 5:00 — Room: SF4308
- Wednesday — 4:00 to 5:00 — Room: SF4308

You may schedule an appointment with Jeremy by email at jerko@cs.toronto.edu.

3 Textbook

The textbook is:

Cormen, Leiserson, Rivest, and Stein. *Introduction to Algorithms*, 3rd edition. 2009, MIT Press.

An electronic copy of the textbook is also available through the University of Toronto Libraries website. Check the course Quercus page for additional lecture materials. You may also use the 4th edition of this textbook, although chapter numbering may differ.

4 Grading Scheme

Your mark for the class will be based on the following components:

- Assignments: 36% (6% each)
- Midterm Exam: 18%
- Final Exam: 46%

You need to score at least 40% on the final exam to pass the course.

5 Assignments

Your assignment solutions must be submitted as a *typed* PDF document. Scanned handwritten solutions, solutions in any other format, or unreadable solutions will **not** be accepted or marked. You are encouraged to learn the LaTeX typesetting system and use it to type your solution.

When working on assignments, you are not allowed to consult other books, solution manuals, or solutions to assigned problems or similar problems on the Internet. You should not discuss homework solutions with anyone other than the instructor and the TA.

The course has 6 assignments, each worth 6% of your final grade. They will be marked based both on its completeness and correctness, and also on the clarity and precision of the explanation. Feedback on the assignments will be given as if they were a research paper submitted to a journal for review.

6 Midterm

The course has one midterm, held in class on Friday, October 24 during regular lecture hours. The exam is 50 minutes. It will cover topics up to the week of the midterm.

7 Final Exam

The final exam is 3 hours long and held sometime during the exam period, December 5 to 23. It covers all topics taught in this course. You need to score at least 40% on the final exam to pass the course.

8 Assignments and Midterm Schedule

The schedule of assignments and midterms is as follows:

- Assignment 1: Posted: Wednesday, Sept 3 — Due: Monday, Sept 15
- Assignment 2: Posted: Monday, Sept 15 — Due: Monday, Sept 29

- Assignment 3: Posted: Monday, Sept 29 — Due: Monday, Oct 13
- Midterm Exam: Friday, Oct 24
- Assignment 4: Posted: Monday, Oct 13 — Due: Monday, Nov 3
- Assignment 5: Posted: Monday, Nov 3 — Due: Monday, Nov 17
- Assignment 6: Posted: Monday, Nov 17 — Due: Monday, Dec 1

9 Late Policy

Every student has one late submission credit, which allows them to be late on one assignment for up to 24 hours. To use the credit the student must notify the instructor within 24 hours before the assignment is due, and give a brief justification. The submission will not be accepted without such a notification. After the credit is used, no other late submission from the same student will be accepted for the remainder of the course. If the assignment is a group assignment, the credit is taken from both members of the group, and no other late assignments will be accepted from either group member for the remainder of the course.

10 Remarking Requests

A remark request can be made by making a private post on Piazza, visible only to the instructors and TA. Clearly indicate why you believe there was an error in the grading. The grade of the entire assignment or exam question may be adjusted, not just for the part indicated in the remarking request. Remarking requests will be accepted up to a week after grades are released for the assignment or exam. A remarking request can be used to alert us to possible mistakes in the grading, but not to question the marking scheme.

11 Piazza

The link to our Piazza forum is https://piazza.com/utoronto.ca/fall2025/csc265h1flec0101/home. You should also be able to access it through Quercus. You should have been automatically invited.

Piazza is a third-party software. It will be used in this class strictly as a discussion board. When posting, abide by the academic integrity policy. In particular, do not post solutions to homework problems. Make sure to read the Piazza terms of use before signing up, and if you have any concerns, contact the instructor directly. If you decide to participate in Piazza, only provide content that you are comfortable sharing under the terms of the Privacy Policy and Terms of Use. When using Piazza, be respectful to your instructors and fellow students. Offensive language and threatening behavior will not be tolerated. Keep in mind that when posting "anonynomously", you are anonymous only to other students, but not to the instructors.

12 Academic Integrity

Every student must abide by the University of Toronto academic integrity policy, and the Code of Student Conduct.

The use of generative artificial intelligence tools and apps is strictly prohibited in all course assignments unless explicitly stated otherwise by the instructor in this course. This includes ChatGPT, Gemini, Claude, Microsoft Copilot and other AI writing and coding assistants. Use of generative AI in this course may be considered use of an unauthorized aid, which is a form of cheating.

13 Tentative Course Schedule

Week	Date	Topic	Reading	Notes
1	Sept 3	Introduction, worst-case analysis, binary heaps	Ch2, Ch3, Ch6	A1 out
2	Sept 8	Binomial heaps, BSTs	Ch6, PDF notes	
3	Sept 15	AVL trees	PDF notes	A1 due, A2 out
4	Sept 22	Augmenting data structures, average case analysis	Ch14, Ch7	
5	Sept 29	Hashing	Ch11	A2 due, A3 out
6	Oct 6	Hashing, amortized analysis	Ch11, Ch17	
7	Oct 13	Amortized analysis, disjoint sets	Ch17, Ch21	A3 due, A4 out
8	Oct 20	Disjoint Sets	Ch21	Midterm
9	Oct 27	Reading Week	-	
10	Nov 3	Graphs, BFS	Ch21.1, Ch21.2	A4 due, A5 out
11	Nov 10	DFS, topological sort	Ch21.3, Ch21.4	
12	Nov 17	Lower bounds	Ch8	A5 due, A6 out
13	Nov 24	Minimum spanning trees	Ch23	
14	Dec 1	Extra topics	-	A6 due