CSC373: Algorithm Design, Analysis and Complexity, 2018S

Professor:	Allan Jepson
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Office:	D.L. Pratt Bldg, Room 283D

Lectures:	Mon., Wed., and Fri., starting Jan. 5 **Sections L0101 and L2003:** 11:10am-noon, Bahen Centre (BA), Room 1190 **Section L0201:** 3:10-4:00pm, Lash Miller (LM), Room 161
Tutorials:	Start Mon, Jan. 15. **Section L0101 and LEC2003:** 4:10-5pm, Bahen Centre (BA), Room 1190 **Section L0201:** 4:10-5pm, Lash Miller (LM), Room 161
Midterm Test #1:	Wed., Jan. 31, during lecture time, rooms TBA.
Midterm Test #2:	Mon., Mar. 12, during lecture time, rooms TBA.
Course Homepage:	`www.cs.toronto.edu/~jepson/csc373`
Course Bulletin Board:	`https://piazza.com/utoronto.ca/winter2018/csc373/home`
Prof's Office Hours:	Wed., 4:10-5pm, or by appointment.

Course Description

Standard algorithm design techniques: divide-and-conquer, greedy strategies, dynamic programming, linear programming, randomization, network flows, approximation algorithms. Brief introduction to NP-completeness: polynomial time reductions, examples of various NP-complete problems, self-reducibility. Additional topics may include approximation and randomized algorithms. Students will be expected to show good design principles and adequate skills at reasoning about the correctness and complexity of algorithms.

Course Texts

- Lecture notes, as posted on course website.
- Both the course homepage and bulletin board are required reading.

Additional References

- Kleinberg and Tardos, Algorithm Design, Addison Wesley, 2006.
- Cormen, Leiserson, Rivest and Stein, Introduction to Algorithms, MIT Press, 2009.

Required Background

A second year course in data structures, such as CSC263, is required, covering balanced trees, heaps, hashing, union-find, and runtime complexity.

Grading

The mark weighting is 12% on each of two midterms (see the dates and times above), 12% on each of three assignments, and 40% on the final exam. If you earn less that 35% on the final exam then your final course grade will be reduced below 50%.

Tutorials

Specific study problems will be distributed weekly and then taken up by the TAs at the subsequent tutorial. Students are encouraged to work on these problems in groups before the tutorial. No marks will be given for this work, but the midterms and final exam will be partly based on these study problems.

Course Schedule

A tentative schedule for the 2018S term is as follows.

Week	Date	Topic
#0	Jan 5	Greedy Algorithms
#1	Jan 8-12	Greedy Algs (cont)
#2	Jan 15-19	Divide and Conquer
#3	Jan 22-26	Dynamic Programming
#4	Jan 29	Dynamic Prog (cont)
	Jan 31	Midterm #1 (During lecture time, Rooms TBA).
	Feb 2	Dynamic Prog (cont)
#5	Feb 5-9	Network Flow
#6	Feb 12-16	Network Flow (cont)
	Feb 19-23	Reading Week (No classes)
#7	Feb 26-Mar 2	P, NP, Polynomial Reductions
#8	Mar 5-9	NP-completeness
#9	Mar 12	Midterm #2 (During lecture time, Rooms TBA).
	Mar 14-16	NP-completeness (cont), co-NP
#10	Mar 19-23	Linear Programming
#11	Mar 26-28	Linear Prog (cont), Approximation Algorithms
	Mar 30	Holiday (No classes)
#12	Apr 2-4	Approximation Algs (cont)
	Apr 5	No class