

COMP 7713/8713 – Advanced Topics Algorithms – Spring 2021

Instructor: Nirman Kumar

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Office hours: By appointment. Please send me email.

Lectures: M W : 2:20 - 3:45 PM, DH 124.

Prerequisites: A basic course on algorithms and complexity. Basic graph theory, combinatorics, probability and linear algebra. Mathematical maturity.

Textbooks: We will mainly cover some material from "Algorithm Design by Jon Kleinberg and Eva Tardos". We may also use "Invitation to Fixed-Parameter algorithms by Rolf Niedermeier". Other reference books are.

1. Introduction to Algorithms (3rd ed.) by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein.
2. Approximation Algorithms by Vazirani. Can be found online at <http://www.cc.gatech.edu/fac/Vijay.Vazirani/book.pdf>
3. The Design of Approximation algorithms by Williamson and Shmoys. A draft can be found online at <http://www.designofapproxalgs.com/book.pdf>
4. Randomized Algorithms by Motwani and Raghavan.
5. Probability and Computing by Mitzenmacher and Upfal.
6. Sariel Har-Peled's notes here - <http://sarielhp.org/teach/notes/algos/files/book.pdf>, and here http://sarielhp.org/teach/13/b_574_rand_alg/book.pdf.
7. Jeff Erickson's algorithm lecture notes at - <http://jeffe.cs.illinois.edu/teaching/algorithms/all-algorithms.pdf>.

Grading: The grading will be done as follows. The scheme is subject to change at instructor's discretion.

- 3 to 4 homeworks with a total weight of 60%. Homeworks will be challenging. Every student must submit their own solutions. Students enrolled in Comp 8713 may get additional problems in the homework.
- Presentation with a total weight of 30%: Each student will give a presentation in class - please choose a topic related to the course material and see the instructor about this.
- 10% for attendance (or following lecture vidoes if we are forced to have online classes).

Plagiarism/Cheating policy: All assignments for this class are to be written individually.

You may refer to a book, or the Internet or some other source but in that case, please acknowledge all such sources in your submission. If I determine that you copied something directly from an external source (book, Internet, or some other source), you will receive a failing grade on the assignment and (at my discretion) a failing grade in the course. If I determine that you have copied another student's assignment, this will happen to both you and the person from whom you copied. The incident may also be forwarded to the University Judicial Affairs Office for further disciplinary action.