

Syllabus – MATH 778C

Prof. Joshua Cooper, Spring 2009

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Office Hours: M2:15–3:45 or by appointment.

Homepage: <http://math.sc.edu/~cooper>

Course Homepage: <http://math.sc.edu/~cooper/math778C/>

Main Text: Arora, Barak, *Complexity Theory - A Modern Approach*

Supplementary Reading: Lecture notes will be provided as needed.

Course Material: Combinatorial aspects of complexity. Cryptography (pseudorandomness, one-way functions), information theory (entropy, extractors, discrepancy), derandomization, enumeration, expanders and quasirandomness. Second of two semesters (the first, Math761, taught by Prof. McNulty).

Note: The last day to drop classes without incurring a “W” is 1/16, and the last day to drop classes without incurring a “WF” is 2/23.

ADA: If you have special needs as addressed by the Americans with Disabilities Act and need any assistance please notify me immediately.

Attendance: You are expected to attend every class. If you *have* to leave before class is over, the correct procedure is to mention this to me before class. It is impolite and disruptive to leave class during a lecture unless you have followed this procedure. You are also expected to turn off or silence your cell phone (or any other noise-making device) before class.

Grade Breakdown: 100% from 4-5 problem sets.

Grading scale: $A \in [90, 100]$, $B+ \in [86, 90)$, $B \in [80, 86)$, $C+ \in [76, 80)$, $C \in [70, 76)$, $D+ \in [66, 70)$, $D \in [60, 66)$, $F \in [0, 60)$.

Problem Sets: Problem sets will be assigned periodically (generally at the start of a new section of material), announced, and posted on the website. Problem sets are due by the expiration date on the posted problem set and will not be accepted after that point. You are generally expected to provide complete, rigorous, and *neat* solutions in order to receive credit. Five extra points will be awarded per problem set for submitting your work in L^AT_EX. (If you are not familiar with this ubiquitous and elegant typesetting tool, now is a good time to learn. There are endless resources available on the web and elsewhere.) I will select submitted solutions to post as an answer key. You will receive five extra points, fame, and glory for each of your solutions that I post.

Learning Outcomes: Students will master concepts and solve problems combinatorial complexity theory.