Math UN1207: Honors Math A
Syllabus

Instructor: David Hansen
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Dave’s office hours: M 2:30-4, T 3:30-5

TAs: Zhechi Cheng, James Yang

Course website: www.math.columbia.edu/~hansen/un1207s1.html

Material: This is a rigorous, accelerated yearlong course in calculus and linear algebra. We will aim to become comfortable with a rather abstract point of view, and experienced in understanding and constructing mathematical proofs. We will begin by revisiting calculus in one variable, concentrating on the theoretical aspects which are skipped in most first-year calculus courses. We will then proceed in the second semester to the algebra and calculus of functions in several real variables.

You should expect to finish this course with a good grounding in basic real analysis and linear algebra, and some facility with the abstract ideas and methods of pure mathematics. To accomplish these goals, you will have to work considerably harder than you would in a normal calculus course. Indeed, each semester of this course is worth 4 points instead of the usual 3, and students who complete it need not take Linear Algebra, Mathematics V2010.

Textbook: Tom M. Apostol, Calculus, Volume I (Wiley). Reading and written assignments will be drawn from this text. Volume II will not be needed until the spring.

Course outline: Roughly, we expect to cover chapters 1–5 and parts of chapters 6–7 and 10–11 in Apostol Vol. I during the fall semester.

Prerequisite: A score of 5 on the Calculus BC Advanced Placement, or a score of 7 on the IB HL Mathematics or Further Mathematics exams, or an A on the U.K. A-Level Further Mathematics exam, or the instructor’s permission.

Homework: Homework will be due on Wednesdays by 5 pm, and must be handed in via the appropriate box on the fourth floor of the math building. You should attempt every homework problem and eventually understand how to do every problem correctly. Collaboration and discussion with your classmates is encouraged, but you must write up assignments individually. Each assignment will also include some supplementary problems which are not to be handed in. You are expected to do these, but when you do them is up to you.

Late homeworks will automatically be marked down by 50%. Your lowest homework grade will be dropped.
Reading: Each assignment will include 40 to 50 pages of reading in Apostol. Much of this will duplicate the lectures, but be warned that not everything in the reading will be covered in the lectures, or vice versa. In principle, you are responsible for both.

Exams: There will be an in-class midterm on October 18, as well as a final exam. Examinations will not be rescheduled because of travel arrangements – it is your responsibility to schedule travel appropriately. Makeup exams will be given only under exceptional circumstances and you will need a note from a doctor or a dean.

Grading: 30% homework, 30% midterm, 40% final exam.

Help: My office hours are Mondays, 2:30-4 PM, and Tuesdays, 3:30-5 PM, but you should also feel free to make an appointment or just drop by. Help is also available without appointment in the Columbia Help Room (406 Math) whenever it’s open.

Academic Dishonesty: The vast majority of students do not cheat. Anyone who does so devalues the hard work of the rest of the class and creates a bad atmosphere for all. Anyone found to have cheated on an exam will receive a failing grade for the course and be subject to administrative discipline. If you are struggling with the material or have a problem regarding an upcoming exam, please discuss it with me instead of resorting to cheating!