

Syllabus for
Math UA 120 - Discrete Mathematics
Section 1
Fall, 2015

Lecture hours: Mondays and Wednesdays: 8:55–10:45 a.m.

Classroom: Silver Center for Arts and Science Room 410

Textbook: Concrete Mathematics: A Foundation for Computer Science, 2nd Edition, by Ronald L. Graham, Donald E. Knuth, and Oren Patashnik (ISBN-13: 9780201558029). We will also cover additional topics, such as logic, graphs and sets.

Course website: http://www.cims.nyu.edu/~calvinz/mathUA120_f15.html

Instructor: Calvin Zhang

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Office: Courant Institute Room 1105A (251 Mercer Street, 11th Floor)

Office hours: Tuesdays: 2:30–4:30 p.m.

Prerequisites: Math UA 121, or Math AD 110/111, with a grade of "C" or better, or high school advanced placement AB/BC credits, or Math Placement Test Calculus 2 with minimal score of 100.

Reading before lectures: It is good practice to preview the materials that will be covered in the upcoming lecture (see pages 3–4 for detailed lecture schedule). Preliminary reading enhances your experience during lectures because it helps you become familiar with the key concepts and motivates you to think about the topic.

Homework: There will be 11 homework sets. Homework sets will be posted on Wednesdays at the course website. You are expected to hand in or email your homework to the instructor before or at the beginning of the following Wednesday class. Hence, you have about a week to work out all the problems and to type/write up your solutions. Our homework grader will be expecting you to express your ideas completely, clearly and legibly. This means you could lose points for incomplete, ambiguous or sloppy answers. To be fair to everybody in this class, late homework is not accepted unless you have extreme hardship of long duration. Note, however, your lowest homework set score will be dropped in your course grade calculation.

Examinations: There will be four 20-min Quizzes, two 70-min Midterm and a 110-min Final. The exams start on time and end on time. The Quizzes and the Midterm will take place in class during regular lecture hours (see pages 3–4 for exam dates). **The Final is on Monday, December 21st** from 8 a.m. to 9:50 a.m. and usually takes place in a different classroom (check NYU Albert system right before the final week for the exact location). Problems in the exams are based on

homework, textbook examples and problems worked out in class. The Final exam will cover all the materials you have learned in the semester. You are expected to strictly adhere to the Honor Code (<http://cas.nyu.edu/page/honorcode>) and the standards of Academic Integrity for Students at NYU.

Make-up exam policy: Make-up exams (including quizzes) are generally not allowed because of limited availability of rooms and proctors. For this reason, we may only approve make-up exams in the following cases: (1) a documented medical excuse; (2) a University sponsored event such as an athletic tournament, a play, or a musical performance, in which case please have your coach, conductor, or other faculty advisor contact your instructor (note that athletic practices and rehearsals do not fall into this category); (3) a religious holiday; or (4) extreme hardship such as a family emergency. You need to notify the instructor at least three calendar days before the exam date in order to be considered for a make-up exam unless your absence is due to an emergency situation. In any case, make-up exams must occur within one week of the scheduled exam.

Grading criteria: The course grade will be determined by an absolute scale with a slight modification if appropriate. An approximate guideline is: 90% - 100% = A-, A; 80% - 89% = B-, B, B+; 65% - 79% = C, C+; 50% - 64% = D, D+, C-; Less than 50% = F. Each component of your graded work will be counted into your course grade with the following weight factors: Homework*: 30%; Quizzes*: 15%; Midterm: 30%; Final: 25%. (* The lowest scored homework assignment and quiz will be dropped from course grade calculation to accommodate unexpected situations.)

Request for regrade: A request for regrade will be accepted if a written request is submitted to the instructor within seven calendar days after graded papers are returned. In your written request, please explain: (1) what part of the exam should be regraded; and (2) why it should be regraded.

Communication with the instructor: Due to the large volume of emails he receives, the instructor may not be able to respond to your emails on time. Therefore, please use the time before and after the class meeting for a short communication. You are most welcome to visit his office during the office hours (see page 1 for his office location and office hours).

Obtaining extensions of time for exams: If you require additional accommodations as determined by the Center for Student Disabilities (please call 212.998.4980), please let your instructor know as soon as possible.

Tentative Lecture Schedule

last updated: November 30, 2015

Day	Date	Sections	Topic	Due	Note
1	Wed, Sep 2, 2015	§1.1, 1.2	recurrent problems		
2	Wed, Sep 9, 2015	§2.1, 2.2	sums and recurrences; logic		post HW 1
3	Mon, Sep 14, 2015	§2.3	manipulation of sums		
4	Wed, Sep 16, 2015		discussion	HW 1	post HW 2
5	Mon, Sep 21, 2015	§2.4, 2.5	multiple of sums; general methods		
6	Wed, Sep 23, 2015	§3.1, 3.2	floors and ceilings; functions	HW 2	Quiz 1 (thru §2.3), post HW 3
7	Mon, Sep 28, 2015	§3.2, 3.3	floors/ceiling recurrences		
8	Wed, Sep 30, 2015	§3.4	MOD (binary operation)	HW 3	post HW 4
9	Mon, Oct 5, 2015		discussion		
10	Wed, Oct 7, 2015	first midterm (thru §3.4)		HW 4	
11	Tue, Oct 13, 2015	§4.1	basics of number theory		
12	Wed, Oct 14, 2015	§4.2	basics of number theory		post HW 5
13	Mon, Oct 19, 2015	§4.5, 4.6	MOD (congruence relation); relative primality; basics of cryptography		
14	Wed, Oct 21, 2015	§5.1	basics of binomial coefficients	HW 5	post HW 6
15	Mon, Oct 26, 2015	§5.1	basics of binomial coefficients		
16	Wed, Oct 28, 2015	§5.1	basics of binomial coefficients		Quiz 2 (thru §5.1)

Day	Date	Sections	Topic	Due	Note
17	Mon, Nov 2, 2015	§5.2	basics of binomial coefficients		
18	Wed, Nov 4, 2015	§5.4	generating functions	HW 6	
19	Mon, Nov 9, 2015	§7.1	domino theory and change		
20	Wed, Nov 11, 2015	§7.2, 7.3	generating functions and recurrence relations		Quiz 3 (thru §5.4), post HW 7
21	Mon, Nov 16, 2015		sets; logic		
22	Wed, Nov 18, 2015		logic		post HW 8
23	Mon, Nov 23, 2015	second midterm (§4.1-§7.3, sets and logic)			
24	Mon, Nov 30, 2015		logic	HW 7	
25	Wed, Dec 2, 2015		graphs	HW 8	post HW 9
26	Mon, Dec 7, 2015		graphs; probability		
27	Wed, Dec 9, 2015	§8.1, 8.2	basics of probability	HW 9	Quiz 4 (sets, logic, graphs)
28	Mon, Dec 14, 2015	§8.3	probability generating functions		
	Mon, Dec 21, 2015	final exam: due 11:59 p.m., December 21 (send your completed final exam to calvinz@cims.nyu.edu)			