Math-UA.120.002: Discrete Mathematics, Fall 2018
Syllabus

Instructor	Fanny Shum, PhD	**Lecture**	Tu Th 11 - 12:50PM
Email	fanny.shum@nyu.edu	**Classroom**	194 Mercer Rm 305
Office	WWH (CIWW) 725	**Course Page**	via NYU Classes
Office hours	TBA	**Questions**	ask via Campuswire
	and by appointment		

Goal & Expectations

This course is a one-semester introduction to discrete mathematics with an emphasis on the understanding, composing, and critiquing of mathematical proofs. At the semester's conclusion, the successful student will be able to:

- Write clear mathematical statements using standard notation and terminology

- Understand and execute a variety of proof techniques (contradiction, induction, etc.).

- Show fluency in the language of basic set theory and Boolean logic

- Understand the basic theorems and their implications in a variety of (discrete) fields, including combinatorics, function theory, number theory, and graph theory

You are expected to attend all classes and be on time. It is important that you come to class prepared by reviewing your class notes and participate in class. You should seek out help if you don't understand the material, for instance, attending office hours or make arrangements for tutoring.

Textbook

Edward A. Scheinerman, *Mathematics: A Discrete Introduction*, 3rd Edition. (ISBN-13: 978-0840049421)

Assessments

Participation	5%
Written Homework	20%
Quizzes	15%
Midterms	35%
Final Exam	25%

Participation (5%)

- Students are expected to attend class, complete in-class work, share their results and respectfully critique each other's work, and to read relevant sections before coming to class.

- The participation grade will be assigned based on regular attendance, presentation of one's work at least once during the semester, and contributing to Campuswire at least once during the semester.

Written Homework (20%)

- Problem sets will be assigned every week. They are due on **Thursdays** before 11PM through Gradescope. **Late** and **emailed homework** will NOT be accepted. One of your lowest homework grade will be *dropped*.

- You are expected to express your ideas clearly, legibly, and completely, often requiring complete English sentences rather than merely just a long string of equations or unconnected mathematical expressions. You may **lose** points for unexplained answers, or poorly prepared and presented papers.

Quizzes (15%)

- **Quizzes** will take place every **Tuesday**, on all sections covered the week prior. One of your lowest quiz grade will be *dropped*.

Exams (60%)

Midterm 1	October 11 (in class)	§1-15
Midterm 2	November 15 (in class)	§16-27
Final Exam	December 18, 10am-11:50am (location TBA)	All

How to succeed in this course:

- **Get your hands dirty in class!** Work on problems in class. Participate when we solve problems together. Get to know your classmates and help each other.

- **Spend time** on all written assignments. Expect each written assignment to take 4-8 hours. This is your opportunity to wrestle with and to internalize new ideas introduced in class. When working on assignments, strive to really understand the deeper ideas.

- **Prepare for quizzes**, for example, by practicing on textbook problems in order to help identify the concepts that you need to understand more deeply.

- **Get help early**:

  - **Attend instructor's office hours**. Office hours schedule, course information, homework assignments, and grades will be posted in the **NYU Classes** page for our section.
  - **Campuswire**: Use Campuswire to post questions and to respond to classmates' questions. When you do, make sure to be courteous and respectful. For homework-related questions, full solutions to homework problems should not be requested or provided.
  - **Form study groups**, but it's critical that you write up your own homework individually.

Course policies

There will be no accommodation for missed homework, quizzes, and exams, except in the cases of illness and observance of religious holidays. In the case of observance of religious holidays, you must make arrangements to make up missed work **at least one week in advance**. In the case of illness, you must present a detailed letter from a physician/health care provider. Students with disabilities can make arrangements at the Moses Center.

Honor Code

We value integrity and do not tolerate academic dishonesty. You are expected to uphold academic integrity as specified by the university and the College of Arts and Sciences (`https://cas.nyu.edu/content/nyu-as/cas/academic-integrity.html`).

Week	Day	Date	Section	Topics	Quiz/HW Due
**MATH 120 TR, Fall 2018 Tentative Calendar**					
1	T	9/4	1-3	Introduction; Definitions	
	R	9/6	4-5	Theorems and Proofs	
2	T	9/11	6-7	Counterexamples; Boolean Algebra	Quiz 1
	R	9/13	8-9	Lists, Factorials	HW 1
3	T	9/18	10-11	Sets, Quantifiers	Quiz 2
	R	9/20	11-12	More Sets	HW 2
4	T	9/25	13	Combinatorial Proofs	Quiz 3
	R	9/27	14-15	Equivalence Relations	HW 3
5	T	10/2	16	Partitions	Quiz 4
	R	10/4	17	Binomial Coefficients	HW 4
6	T	10/9		**Legislative Monday - No Classes**	
	R	10/11		**MIDTERM 1**	
7	T	10/16	20	Contradiction	
	R	10/18	21	Well-Ordering Principle; Induction	HW 5
8	T	10/23	22	Induction	Quiz 5
	R	10/25	23	Polynomial Sequence	HW 6
9	T	10/30	24-25	Functions; Pigeonhole Principle	Quiz 6
	R	11/1	26	Composition	HW 7
10	T	11/6	27	Permutations	Quiz 7
	R	11/8	27	Permutations	HW 8
11	T	11/13	35-36	Divisibility: Greatest Common Divisor	
	R	11/15		**MIDTERM 2**	
12	T	11/20	37	Modular Arithmetic	Quiz 8
	R	**11/22**		**Thanksgiving Break - No Classes**	
13	T	11/27	47	Graphs	
	R	11/29	48-49	Subgraphs	HW 9
14	T	12/4	49	Connection	Quiz 9
	R	12/6	50	Trees	HW 10
15	T	12/10	51	Eulerian Graphs	Quiz 10
	R	12/13	52	Coloring	HW 11
16	**T**	**12/18**		**Final Exam (10am – 11:50am), location TBA**	