Math-UA.140.006: Linear Algebra, Fall 2017
Syllabus

Instructor	Fanny Shum, PhD	**Lecture**	MW 12:30 - 2:20 pm
Email	fanny.shum@nyu.edu	**Classroom**	WWH 201
Office	WWH 725	**Course Page**	via NYU Classes
Office hours	TBA and by appointment	**Questions**	ask via Piazza

Goal & Expectations

Linear algebra is a cornerstone of any mathematics curriculum for two very important (and related) reasons:

1. The theory of linear algebra is well understood and so a first step in many areas of applied mathematics is to reduce the problem into one in linear algebra.
2. The spaces and operations studied in the subject are commonplace in many different areas of mathematics, science, and engineering.

Students will leave the course with a computational ability and conceptual understanding of solving linear equations, vector spaces and subspaces, orthogonality, determinants, eigenvalues and eigenvectors, linear transformations and selected applications.

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

Strang, G. *Introduction to Linear Algebra.* 5th Edition.

Assessments

Written Homework	20%
Quizzes	20%
Midterms	35%
Final Exam	25%

Written Homework (20%)

- Problem sets will be assigned approximately every week. They are due **Sunday at 5pm** via Gradescope. **Late** and **emailed homework** will not be accepted. One of your lowest homework grade will be *dropped*.

Quizzes (20%)

- **Quizzes** will take place every **Wednesday**. It will consists of material covered the week prior. One of your lowest quiz grade will be *dropped*.

Exams (60%)

Midterm 1	October 18 (in class)	Ch 1 - 3
Midterm 2	November 20 (in class)	4.1 - 6.1
Final Exam	TBD (location TBA)	All

Calculators

Calculators are permitted in class and for homework, but they are not required. Calculators **will not be permitted on exams and quizzes**, and thus it is emphasized that students learn not to rely on them.

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 assignments. 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 behind the computations.
- **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.
  - **Piazza**: Use Piazza 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 (`http://cas.nyu.edu/page/academicintegrity`).

MATH 140 MW, Fall 2017 Tentative Calendar

Week	Day	Dates	Chapter	Topics	HW Due Sunday at 5pm
1	W	09/06/17	1.1-1.2	Introduction, Vectors, Dot Product	HW0
2	M	09/11/17	1.3	Matrices	
	W	09/13/17	2.1-2.2	Linear Systems/Elimination	HW1
3	M	09/18/17	2.3-2.4	Matrix Operations	
	W	09/20/17	2.5	Inverses	HW2
4	M	09/25/17	2.6-2.7	PA=LU Factorization	
	W	09/27/17	3.1	Vector Spaces	HW3
5	M	10/02/17	3.2-3.3	Nullspace and Rank	
	W	10/04/17	3.4	Complete Solutions	HW4
6	**M**	**10/09/17**		**Fall Recess - No Class**	
	W	10/11/17	3.5	Independence/Dimension	HW5
7	M	10/16/17	4.1	The Four Subspaces and MIDTERM REVIEW	
	W	**10/18/17**		**MIDTERM 1 (1.1-3.5)**	
8	M	10/23/17	4.1	Orthogonality of the Four Subspaces	
	W	10/25/17	4.2	Projections	HW6
9	M	10/30/17	4.3	Least Squares	
	W	11/01/17	4.4	Orthogonal Bases	HW7
10	M	11/06/17	5.1-5.2	The Determinant	
	W	11/08/17	5.3	Applications of determinants	HW8
11	M	11/13/17	6.1	Eigenvalues	
	W	11/15/17	6.2	Diagonalization and MIDTERM REVIEW	HW9
12	**M**	**11/20/17**		**MIDTERM 2 (4.1-6.1)**	
	W	**11/22/17**		**Thanksgiving Recess - No Class**	
13	M	11/27/17	6.2	Diagonalization	
	W	11/29/17	6.4-6.5	Symmetric matrices	HW10
14	M	12/04/17	7.1-7.2	SVD	
	W	12/06/17	7.3-7.4	Principal component analysis	HW11
15	M	12/11/17	8.1-8.2	Linear Transformations	
	T	12/12/17	8.2-8.3	Change of Basis	
	W	12/13/17		*FINAL EXAM REVIEW*	HW12
16				**Final Exam - TBA**	