Enrollment issues or other questions about math courses?

Please contact the registrar or the Math Department Undergraduate Advising Team.

Question that might be useful for other students to hear?

Please ask on Piazza!

Instructor: David Nadler

Office Hours: Wednesdays 12-2pm, 891 Evans.

GSIs, office hours, locations

You must turn in homework and take quizzes within your assigned section, but you are welcome and encouraged to attend the office hours of any GSI.

- Franchesca Cavagnaro, Tu 2:30-3:30pm, F 12-1pm, 1060 Evans
- Luke Corcos, M 1-2pm, F 1-2pm, 1066 Evans
- Yifeng Ding, Tu 10-11am, W 10-11am, 937 Evans
- Andrew Hanlon, Tu 10:30-11:30am, 3:30-4:30pm, 853 Evans
- Chris Kuo, Tu 11am-12pm, Th 11am-12pm, 820 Evans
- Ruochen Liang, Tu 4-5pm, Th 4-5pm, 930 Evans
- Satyaki Mukherjee, M, F 3-4pm, 741 Evans
- Umed Paliwal, F 2-4pm, 779 Evans
- Mohandas Pillai, M 1-2pm, F 1-2pm, 835 Evans
- Saghi Sadoughi, M 12-1pm, W 12-1pm, 779 Evans
- Benjamin Siskind, Tu 11:15am-12:15pm, W 2:30-3:30pm, 937 Evans
- Joe Stahl, M 2-3pm, Tu 2-3pm, 1062 Evans
- German Stefanich, Tu 9-11am, 820 Evans

Midterm 1 extra office hours/review sessions; you are welcome and encouraged to attend those of any GSI:

- David Nadler: Thursday, September 21, 2-3:30pm, 740 Evans.
- GSIs: see Piazza post.

Midterm 2 extra office hours/review sessions; you are welcome and encouraged to attend those of any GSI:

- David Nadler: Thursday, October 26, 2-3:30pm, 740 Evans.

  [Peijie's notes](#), [Nicole's notes](#), [Delaney's notes](#)

- GSIs: see [Piazza post](#).

Final exam instructor availabilities, all during RRR Week unless otherwise noted; you are welcome and encouraged to attend reviews and office hours of any GSI:

- David Nadler, office hours: TBA
- GSIs: TBA, see [Piazza post](#).

Lectures: Tuesday, Thursday 12:30-2pm, Wheeler Auditorium.

Discussion sections: Monday, Wednesday, Friday

Class number:16585

Prerequisites: Math 1B or equivalent preparation.

Required text: Lay and Nagle, Saff & Snider, *Linear Algebra and Differential Equations*, combined Berkeley custom second edition.

Syllabus: Basic linear algebra; matrix arithmetic and determinants. Vector spaces; inner product spaces. Eigenvalues and eigenvectors; linear transformations, symmetric matrices. Linear ordinary differential equations (ODE); systems of linear ODE. Fourier series.

We will cover the following sections of the textbook:

1. **Part 1: Linear algebra (Lay)**

1. Chapter 1: Linear equations in linear algebra
   Sections 1.1-1.5, 1.7-1.9
2. Chapter 2: Matrix algebra
   Sections 2.1-2.3
3. Chapter 3: Determinants
   Sections 3.1-3.3
4. Chapter 4: Vector spaces
   Sections 4.1-4.7
5. Chapter 5: Eigenvalues and eigenvectors
   Sections 5.1-5.4
6. Chapter 6: Orthogonality and least squares
   Sections 6.1-6.5, 6.7
7. Chapter 7: Symmetric matrices and quadratic forms
   Sections 7.1-7.2 & supplementary material

2. **Part 2: Differential Equations (NS&S)**
   1. Chapter 4: Linear second-order ODE
      Sections 4.2-4.6
   2. Chapter 9: Systems of linear ODE
      Sections 9.1, 9.4-9.7 & supplementary material
   3. Chapter 10: Fourier Series, application to PDE
      Sections 10.3-10.5

Grading policy: Based on homework (5%), quizzes (20%), two in-class midterms and the final exam (75%).

We will drop your two lowest quiz scores and your two lowest homework scores.

Each midterm will be worth 25% and the final exam will be worth 50% = 2 x 25%. Of these four 25% scores, we will drop the lowest and keep your best three to arrive at 75%.

Example: Alice's scores are Midterm 1: 90, Midterm 2: 82, Final exam: 94.
So her four 25% scores are 90, 82, 94, 94.
We will drop 82 and average 90, 94, 94 to arrive at 92 2/3.

Example: Bob's scores are Midterm 1: 91, Midterm 2: 93, Final exam 88.
So his four 25% scores are 91, 93, 88, 88.
We will drop one 88 and average 91, 93, 88 to arrive at 90 2/3.

Final grades will roughly follow historical distributions as recorded at berkeleytime.

Course policies

Academic honesty: You are expected to rely on your own knowledge and ability, and not use unauthorized materials or represent the work of others as your own. Protect your integrity and follow the honor code: "As a member of the UC Berkeley community, I act with honesty, integrity, and respect for others."

There will be no make-up exams or quizzes. No late homework will be accepted.

Grades of Incomplete will be granted only for dire medical or personal emergencies that cause you to miss the final, and only if your work up to that point has been satisfactory.

Exams

Midterm 1: during lecture meeting, **Tuesday, September 26, 2017**, material: up to and including Lay Ch. 3.3.

Mean: 50.2/60, Median: 52.5/60, Standard deviation: 8.6

Midterm 2: during lecture meeting, **Tuesday, October 31, 2017**, material: up to and including Lay Ch. 6.5.

Mean: 39.4/60, Median: 40.5/60, Standard deviation: 10.7

Final Exam: **Thursday, December 14, 2017, 3-6pm (Exam Group 15)**, material: entire course.

Quizzes

There will be weekly quizzes during **Friday** discussion sections. They will be modeled on the sample quizzes below.

Homework and Lecture Notes

There will be homework attached to each lecture. Homework for Tuesday lectures is due the following **Monday**. Homework for Thursday lectures is due the following **Wednesday**.

Please follow your individual GSI's instructions as to how to turn it in.

You are encouraged to discuss ideas with other students. However, you must write and hand in your solutions independently.

Each week one or two problems from the homework assignments will be graded.

	Lecture date	Text sections	Lecture notes	Homework Assignment
1	Th 8/24	**Lay, Ch. 1.1,1.2**	Lecture 1	**1.1:** 1,5,7,13,15,20,28; **1.2:** 1,5,7,11,15,23,26,30
2	Tue 8/29	**Lay, Ch. 1.3,1.4**	Lecture 2	**1.3:** 1,5,7,11,15,22,25; **1.4:** 1,5,7,9,11,17,18,29
3	Th 8/31	**Lay, Ch. 1.5,1.7**	Lecture 3	**1.5:** 1,5,9,14,24,29; **1.7:** 1,5,11,17,21,23,33,36
4	Tue 9/5	**Lay, Ch. 1.8,1.9**	Lecture 4	**1.8:** 1,3,9,15,19,21,33,36; **1.9:** 1,5,9,15,23,24
5	Th 9/7	**Lay, Ch. 2.1,2.2**	Lecture 5	**2.1:** 1,3,7,11,15,23,27; **2.2:** 1,5,9,13,21,38
6	Tue 9/12	**Lay, Ch. 2.3,3.1**	Lecture 6	**2.3:** 1,3,7,11,13,15,19,30; **3.1:** 1,5,9,13,19,21, 41
7	Th 9/14	**Lay, Ch. 3.2,3.3**	Lecture 7	**3.2:** 1,3,5,7,11,19,21,27,31,33-35; **3.3:** 3,7,13,21,32
8	Tue 9/19	**Lay, Ch. 4.1,4.2**	Lecture 8	**4.1:** 1,3,9,13,24,32; **4.2:** 1,3,5,7,9,23,25
9	Th 9/21	**Lay, Ch. 4.3,4.4**	Lecture 9	**4.3:** 3,7,13,15,21,32; **4.4:** 1,3,7,15,19,27
	Tue 9/26	**Midterm 1**		material: **up to and including Lay Ch. 3.3**
10	Th 9/28	**Lay, Ch. 4.5,4.6**	Lecture 10	**4.5:** 3,7,11,15,26,27; **4.6:** 1,5,9,15,22,33
11	Tue 10/3	**Lay, Ch. 4.7**	Lecture 11	**4.7:** 3,5,9,11,13
12	Th 10/5	**Lay, Ch. 5.1,5.2**	Lecture 12	**5.1:** 1,5,7,9,13,17,21; **5.2:** 3,9,11,15,19,21
13	Tue 10/10	**Lay, Ch. 5.3,5.4**	Lecture 13	**5.3:** 1,3,5,7,11,17,21; **5.4:** 3,5,7,15
14	Th 10/12	**Lay, Ch. 5.5,6.1**	Lecture 14	**5.5:** 1,3,7,13,15; **6.1:** 1,5,7,19,22,24
15	Tue 10/17	**Lay, Ch. 6.2,6.3**	Lecture 15	**6.2:** 5,7,9,13,15,23; **6.3:** 1,3,9,11,17,21
16	Th 10/19	**Lay, Ch. 6.4,6.5**	Lecture 16	**6.4:** 1,3,5,9,17; **6.5:** 1,3,9,11,17

17	Tue 10/24	**Lay, Ch. 6.7,7.1**	[Lecture 17](#)	**6.7:** 1,5,7,11,16; **7.1:** 3,5,9,17,25
18	Th 10/26	**Lay, Ch. 7.2**	[Lecture 18](#)	**7.2:** 1,5,7,19,23,24,27
	Tue 10/31	**Midterm 2 ([Boo!](#))**		material: **up to and including Lay Ch. 6.5**
19	Th 11/2	**[Lay, 5th edition, Ch. 7.4](#)**	[Lecture 19](#)	**5th edition, 7.4:** 1,3,7,9,17,20,25
20	Tue 11/7	**NS&S, Ch. 4.2,4.3**	[Lecture 20](#)	**4.2:** 3,5,10,13,27,34; **4.3:** 1,3,21,24,29(b)
21	Th 11/9	**NS&S, Ch. 4.4,4.5**	[Lecture 21](#)	**4.4:** 3,5,7,13,21,27,31,33; **4.5:** 1(b),3,5,9,21,27,33
22	Tue 11/14	**NS&S, Ch. 4.6,9.1**	[Lecture 22](#)	**4.6:** 1,3,9,11; **9.1:** 3,7,10,13
23	Th 11/16	**NS&S, Ch. 9.4,9.5**	[Lecture 23](#)	**9.4:** 3,7,13,16,19,23,27; **9.5:** 13,17,21,31,35
24	Tue 11/21	**NS&S, Ch. 9.6,9.7**	[Lecture 24](#)	**9.6:** 3,9,13,19; **9.7:**3,5,13,15,21
	Th 11/23	**Happy Thanksgiving!**		Give thanks to [Sarah Josepha Hale](#)
25	Tue 11/28	**NS&S, Ch. 10.3,10.4**		**10.3:** 1,5,7,11,17,19,26,27; **10.4:** 1,3,5,11,17,19
26	Th 11/30	**NS&S, Ch. 10.5**		**10.5:** 3,7,9,15,17
	Tue 12/5	**Review Session: Lay**		
	Th 12/7	**Review Session: NS&S**		
	Th 12/14	**Final Exam**		material: **entire course**

Useful Resources

Some previous Math 54 course web pages:

- Nikhil Srivastava's [Fall 2016 Math 54](#).
- David Nadler's [Fall 2015 Math 54](#).
- David Nadler's [Fall 2014 Math 54](#).
- Katrin Wehrheim's's [Fall 2014 Math 54](#).
- Alberto Grunbaum's [Fall 2013 Math 54](#).
- Alberto Grunbaum's [Fall 2012 Math 54](#).

- Maciej Zworski's [Spring 2012 Math 54](#).
- Olga Holtz's [Fall 2010 Math 54](#).
- John Lott's [Spring 2010 Math 54](#).
- Peyam Tabrizian's [Math 54 web page](#).
- George Melvin's [Math 54 webpage](#).

Study help and tutoring:

- Study groups, reviews, and drop-in tutoring for Math 54 at the [Student Learning Center](#).
- Math department list of [tutors](#).

Some online linear algebra:

• J. Strom, K. Astrom, and T. Akenine-Moller, [Immersive Linear Algebra](#), "The world's first linear algebra book with fully interactive figures." (Thanks to Alven Wang for the link.)

• 3Blue1Brown, [Essence of Linear Algebra](#), youtube videos. (Thanks to Carly de Frondeville for the link.)