33A/1 Linear Algebra – Spring 2016

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Lectures: Mon-Wed-Fri – 2.00-2.50pm, HUMANTS A51
Exam Dates: 04/22 (Midterm 1) – 05/20 (Midterm 2) – 06/06 (Final).

This document may be updated throughout the course, please check the materials webpage to make sure you have the latest version.

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1 Topics

The course will be divided into three blocks, each followed by an exam. The final exam covers the entire course. Note that everything covered in the lectures is examinable, including material that is not in the book. Please see the course webpage for a detailed and up-to-date list of examinable topics.

Linear Equations, Linear Transformations and Subspaces of $\mathbb{R}^n$

- Linear Systems
- Vectors
- Matrices
- Gauss-Jordan Elimination
- Matrix Algebra
- Linear Transformations
- Image and Kernel
- Subspaces of $\mathbb{R}^n$
- Bases and Linear Independence
- Dimensions
- Determinants
- Coordinates

Eigenvalues, Eigenvectors, Orthogonality, Least Squares

- Diagonalization
- Finding Eigenvalues and Eigenvectors
- Complex Eigenvalues
- Orthogonal Projections
- Orthonormal Bases
- Gram-Schmidt Process
- $QR$ Factorization
- Orthogonal Transformations and Matrices
2 Collaborating

Mathematics can be scary, and frustrating. You will all come into this lecture with different levels of mathematical experience. It is okay not to know things. We all started out knowing nothing about linear algebra. We are in this together and we, myself included, discover new ways of seeing problems all the time. Collaborating with each other can be extremely productive, no matter what level you are. (There are very few single-author journal articles in mathematics.) Ask for help if you need it, and help others if they need it.

3 Textbook

I recommend getting the textbook, especially if you need extra material and exercises. However, all the material that you need to know for the exams will be in the lecture notes. I will also provide many free, alternative sources of explanations, visualizations and practice material.

4 Lectures

I strongly recommend that you attend all lectures. If you miss a lecture, then you should ask classmates for their notes and any important messages from the lecture. Attending lectures is key to your success, not only in this course, but in all your courses at UCLA.

5 Piazza

We will be using Piazza for discussions outside the classroom. You will receive an invitation for this. If you cannot find this, then speak to your TA who will help set you up. Piazza is very easy to use and you may ask questions about anything related to the class and materials, even anonymously if you are feeling shy.
6 Grading

There will be a dual grading scheme. Your grade is based on the higher score resulting from the following two schemes:

Scheme 1:
- 10% Homework
- 10% Quizzes
- 20% Midterm 1
- 20% Midterm 2
- 40% Final Exam

Scheme 2:
- 10% Homework
- 10% Quizzes
- 30% Higher Midterm score
- 50% Final Exam

The resulting numerical score will be converted to a letter grade based on class ranking. Grades will be recorded using the myUCLA gradebook facility. Requests for regrading quizzes or midterms will only be considered within 14 days of the date of the test, and no later than the day before the final.

7 Homework

Homework is posted on Fridays and is due on Friday one week later. Homework is handed in to the lecturer at the beginning of the lecture. It is graded by the reader and discussed in the discussion section. The discussion sections that have quizzes do not require any homework to be handed in. Homework sheets 2, 5 and 8 are not handed in, but should be completed as practice for the quizzes. Homework typically consists of questions ranging from easier than exam questions to more difficult than exam questions. The grade for your homework is the mean grade of your 4 best (out of 6 homework sets that are graded).

Late hand-ins will not be accepted.
8 Quizzes

Click this link to confirm that you have read the syllabus. There will be three quizzes: in week 3, 6 and 9. Quizzes take about 20 min and are held at the beginning of discussion sessions. They will typically consist of three questions. Your total quiz grade is the mean of your two best quizzes.

9 Exams

There will be two midterms in class, on Friday, April 22 and Friday, May 20. The final exam will take place on June 6. Exams must be taken during the scheduled times. There will be NO make-up exams with the exception of serious medical emergencies or university approved absences. A grade of ‘F’ will be assigned to any student who misses the final. Incompletes are reserved for those who have completed all of the work for the class, including the midterms, but who, for a legitimate, documented reason, miss the final.