

# Math 170A Syllabus

## General Information

**Instructor:** Chris Tiee

**Office:** AP&M 5121

**Office hours:** Tuesdays & Thursdays at 1:00p-2:00p, or by appointment.

**Contact:** [ctiee@ccom.ucsd.edu](mailto:ctiee@ccom.ucsd.edu)

## Class Forum and Email Policy:

The **best way** to keep up-to-date about the course is via [this course's Piazza page](#). Sign up for this class on Piazza [here](#). (Or look for an activation email from Piazza: data from TED was transferred over and you have been sent an invitation; **check your official UCSD email address**.) Piazza includes a discussion forum to ask general questions that can be answered by the instructor, TAs, or fellow students. To help accommodate people who may feel uncomfortable posting with their identities, anonymous postings are also allowed. Piazza also has an equation editor that allows display of math notation not available in email.

Because of these available resources, and the anticipated large size of the class, **please check Piazza first (and maybe ask there), and then this webpage, before sending emails**. Any such email answerable by other means will not get a response. Many questions about homework assignments will require in-depth responses, which are more appropriately answered in office hours; in that case, email should primarily be used to set up appointments in case you cannot make it to an office hour. Please be considerate and remember that I am a fellow human who has other life responsibilities outside of work, so not every email, especially those out of reasonable working hours, can be expected to receive a prompt response.

There is also [TED](#) for this course, though it will only be, for our purposes, a place to check your grades. Piazza will still be the main place for discussion.

**Lecture Meeting Times and Location: MWF 12:00p-12:50p in Pepper Canyon Hall (PCYNH) 106**

**Sections and TAs:** Your TAs are [Francesca Grogan](#), [Yi Luo](#), and [Jeremy Schmitt](#).

Section	Time	Location
A01	W 5:00p-5:50p	<b>AP&amp;M 2301</b>
A02	W 6:00p-6:50p	<b>AP&amp;M 2301</b>
A03	W 7:00p-7:50p	<b>AP&amp;M 2301</b>
A04	W 8:00p-8:50p	<b>AP&amp;M 2301</b>
A05	W 4:00p-4:50p	<b>AP&amp;M B412</b>

**Catalog Description:** 170A. INTRODUCTION TO NUMERICAL ANALYSIS: LINEAR ALGEBRA (4)  
Analysis of numerical methods for linear algebraic systems and least squares problems. Orthogonalization methods. Ill-conditioned problems. Eigenvalue and singular value computations. Three lectures, one recitation. Knowledge of programming recommended.

**Textbook:** *Fundamentals of Matrix Computations*, Third Edition, by David S. Watkins.

**Prerequisite:** Math 20F (knowledge of programming basics or MATLAB basics, which should have been covered in 20F, is highly recommended [but see below in Grading and Exam policies])

## Grading and Exam Policies

There will be 5 homework assignments, assigned from the textbook. Some of the problems involve a computer programming component, using MATLAB (for people who have not done MATLAB or haven't taken Math 20F, e.g., transfer students, here is a [quick crash course](#) and [here are the MATLAB projects for Math 20F](#), which teaches MATLAB to you from the ground up; also do Exercise 1.1.8, part of Homework 1, anyway, in the book to refresh yourself).

There are two midterms (on Friday 1/29/16 and Friday 2/26/16) and a final exam (on Wednesday 3/16/16). The grading breakdown is as follows:

### Category Weight

Homework 30%

Midterm 1 15%

Midterm 2 15%

Final 40%

Here are the main points to remember about exams:

- You may bring an 8.5 x 11, double-sided sheet of notes to the midterms, and two such note sheets to the final.
- **No make-up exams will be given.** In the case of, and **only in the case of**, a medical emergency, with a doctor's note, you may be excused from an exam, and your grade will be determined by re-weighting the other exams.
- No calculators will be allowed (or needed) on the exams.
- **Exams will be heavily based on homework.** Therefore it is to your advantage to do the homeworks, go to lecture, discussion sections, and office hours to get proper feedback, even after you have submitted it or received a grade for it, and even if such a grade received is good.
- Grades will be adjusted ("curved") in a way so that **an average grade will be no lower than a B-**. However, we will strive to make exams in a fair manner that eliminates the need to adjust the grading scale: the curve exists as an insurance policy for differences in opinion of what I think is "reasonable" and "based on homework".

### Homework

There will be five homework assignments, due on Fridays at 11:59pm every other week. Homework will be submitted electronically through [Gradescope](#). You will automatically be enrolled in it using your official UCSD email. If you need to sign up manually (for example, if you are on the wait list), the entry code is 96KPKM. Submission is easy, and there are a number of short videos there demonstrating how to do it (basically: scan your homework, or take photos with any mobile device: it does NOT have to be high-resolution). The homework will be from the textbook, and will include a number of exercises in MATLAB. No late homework will be accepted except for medical reasons. The electronic submission system won't count it if it is late, so due dates will deliberately be placed late at night.

### Lecture Schedule

The following is an approximate schedule for the class. **Adjustments may occur as things come up during the quarter**; see the [Announcements](#) section as well as [Piazza](#) to stay up to date.

Week	Topics Covered
Week 1 (1/4-1/8)	<b>1.1-1.5:</b> Brief review of background and notation, Cholesky Factorization, and Sparse Matrices.
Week 2 (1/11-1/15)	<b>1.6-1.9, 2.1-2.2:</b> Gaussian Elimination/LU Decomposition and Intro to Sensitivity of Linear Systems. Homework 1
Week 3	

(1/19-1/22)	<b>3.1-3.4:</b> The Least Squares Problem.
<b>[Note: MLK Jr. Day is on 1/18, and there will be NO CLASS]</b>	
Week 4 (1/25-1/29)	<b>3.4-3.6, Review, and Midterm:</b> Covering Chapters 1-3. Homework 2. Midterm 1. Covers: 1.1-1.7, 2.1-2.2, 3.1-3.3.
Week 5 (2/1-2/5)	<b>4.1-4.4:</b> The Singular Value Decomposition (SVD)
Week 6 (2/8-2/12)	<b>5.1-5.4:</b> Eigenvalues and Eigenvectors I. Homework 3.
Week 7 (2/16-2/19)	
<b>[Note: Presidents' Day is on 2/15, and there will be NO CLASS]</b>	<b>6.1-6.2:</b> Eigenvalues and Eigenvectors II.
Week 8 (2/22-2/26)	<b>Review and Midterm:</b> Covering Chapters 4-6. Homework 4. Midterm 2. Covers: 4.1-4.3, 5.1-5.4, 3.4-3.5.
Week 9 (2/29-3/4)	<b>8.1-8.4:</b> Iterative Methods for Linear Systems.
Week 10 (3/7-3/11)	<b>Review for Final:</b> Covering Main Parts of Chapters 1-6 and 8. Homework 5.
Final <b>WED 3/16</b> <b>11:30a-2:30p</b> (Location TBA)	<b>Final Exam:</b> Covers: Main Parts of Chapters 1-6 and 8. In particular: Covers Homeworks 1-5. Very specifically: Covers sections 1.1-1.7, 2.1-2.2, 3.1-3.5, 4.1-4.3, 5.1-5.4, 5.6, 6.1-6.2, 8.1-8.4, 8.7. Review Sessions and Extra Office Hours TBA