

# Mathematical Methods for Robotics, Vision, and Graphics

CS 205A, Spring 2017

## Course Description

Continuous mathematics background necessary for research in robotics, vision, and graphics. Possible topics: linear algebra; the conjugate gradient method; ordinary and partial differential equations; vector and tensor calculus. Prerequisites: 106B or X; MATH 51; or equivalents.

## 1 Basic Information

### 1.1 Staff

- { **Instructor:** Prof. Doug James  
**Office:** Gates 362  
**Telephone:** 650-723-0104  
**Email:** djames@stanford.edu  
**Office hours:** Tu 5-6pm, Th 5-7pm (Gates 362)
  
- { **Course assistant:** Alex Jin  
**Email:** agbjin@stanford.edu  
**Office hours:** Thu 10am-noon (Lathrop Tech Lounge) (will start 2nd week)
  
- { **Course assistant:** Rafael Musa  
**Email:** rmusa@stanford.edu  
**Office hours:** Wed 2-4pm (Huang Basement) (will start 2nd week)
  
- { **Course assistant:** Leon Yao  
**Email:** leonyao@stanford.edu  
**Office hours:** Tue 12:30-2:30pm (will start 2nd week)

### 1.2 Class

- { **Time:** TuTh 3:00-4:20am  
**Place:** Gates B1

### 1.3 Section

- { **Time:** F 11:30am-12:20pm  
**Place:** Hewlett Teaching Center 201

## 1.4 Web

The **course web page**, which will contain lecture slides, homeworks, announcements, and other important materials, can be found at:

<http://graphics.stanford.edu/courses/cs205a-17-spring>

**Piazza:** We will be using Piazza to host a course bulletin board and for some online announcements; be sure to register for the CS 205A page. All students are expected to register at:

<http://piazza.com/stanford/spring2017/cs205a>

**Gradescope:** Homeworks are to be submitted electronically online using *gradescope* at

<https://gradescope.com/courses/7422>

Registered students can use this entry code to add themselves: **MZXEBM**. For each homework, you will scan/photograph or electronically author your submission, then submit it online via *gradescope*.

## 2 Course Policies

### 2.1 Grading

Your grade will be evaluated using the following distribution:

Item	Percentage
Homework (approx. weekly)	60%
Midterm	15%
Final	25%
Participation	±5%

### 2.2 Late Assignments

There will be several assignments throughout the quarter, with late submissions handled as follows. The deadline to upload your work to Gradescope will be Thursday 11:59 pm. You have a total of 3 late periods. Using a late period means you can submit an assignment by Sunday 11:59 pm. If you exhaust your late periods, late assignments will be penalized at 50%. No work will be accepted after the late deadline.

### 2.3 Textbook

The primary textbook for CS 205A is *Numerical Algorithms*, by Justin Solomon (a former CS205a instructor and Stanford PhD student, and now an MIT professor); the text was written specifically for this course. The textbook is available from common book vendors, and a PDF is available online from the author's MIT website. A supplementary optional textbook is *Scientific Computing*, by Heath. This textbook covers similar material and has alternative explanations that may appeal to some students.