Mathematical Methods for Robotics, Vision, and Graphics
CS 205A, Winter 2018

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:** Mike Roberts
  **Email:** mlrobert@stanford.edu
  **Office hours:** See webpage (start 2nd week)

- **Course assistant:** Ante Qu
  **Email:** antequ@stanford.edu
  **Office hours:** See webpage (start 2nd week)

1.2 Class

- **Time:** TuTh 3:00-4:20am
- **Place:** Gates B3

1.3 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-18-winter

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/winter2018/cs205a
Gradescope: Homeworks are to be submitted electronically online using gradescope at https://gradescope.com/courses/13993. Registered students can use this entry code to add themselves: 9P584R. 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:

<table>
<thead>
<tr>
<th>Item</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework (approx. weekly)</td>
<td>60%</td>
</tr>
<tr>
<td>Midterm</td>
<td>15%</td>
</tr>
<tr>
<td>Final</td>
<td>25%</td>
</tr>
<tr>
<td>Participation</td>
<td>±5%</td>
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</tbody>
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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 for an assignment due on a Thursday 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.