

**ME 290R Topics in Manufacturing, Spring 2013:
Computer-Aided Design and Manufacturing**
<http://www.me.berkeley.edu/~mcmains/290R/>

Instructor: Prof. Sara McMains
5145 Etcheverry Hall, 852-9359
Office Hours: W 12:30-1:30, Th 1-2pm
(note: will start Wed OH in 1165 Etch)

Lectures:

MW 11-12:30 1165 Etcheverry

Required Materials:

The only required reading will be handouts and research papers that will be distributed in class or made available via the course web site.

Several of the homework assignments will require programming in Matlab.

Requirements:

Read assigned papers and turn in short summaries at the start of lecture.

2 midterm quizzes, closed book, on the reading & lecture material

(tentatively scheduled for March 11 & May 1)

~6 homework assignments

Grading:

45% Homework

45% Quizzes

10% Paper summaries and class participation

Pre-requisites:

Graduate standing in engineering or permission of instructor.

Course Topics:

Applications drawn from:

- CAD/CAM
- Computer Aided Process Planning (CAPP)
- Robotics
- Inspection
- Reverse Engineering
- Mold-making/Casting
- 3D Printing
- Fixturing
- Tolerancing

Tools & Techniques drawn from:

- Solid modeling
- Graph-based methods
- Offsets
- Medial axis transforms (skeletons)
- Space and data partitioning
- Minkowski sums
- Voronoi diagrams
- Delaunay triangulations
- Numerical accuracy and robustness
- Boundary representations (B-reps)
- Constructive Solid Geometry (CSG)
- Mesh simplification
- Boundary healing