

# ME 224: Mechanical Behavior of Engineering Materials

Fall Semester 2010

**Units:** 3

**Lectures:** Tue./Thu. 3:30-5:00 3107 Etcheverry Hall

**Instructor:** Prof. T. I. Zohdi,

**Office hours:** TBA, Room 6117 Etcheverry Hall

**Phone/email:** 642-9172, zohdi@me.berkeley.edu

**Discussion sessions:** TBA

**GSI:**

**Email:**

**GSI Office hours:** TBA

**Text:** Course notes.

**Grading:** The course grade will be approximately based on the following scheme:

- Midterm Exam: 25 %
- Homework projects and “pop” quizzes: 25 %
- Final Exam: 50 %

I will solve “key” problems in class. The GSI will solve more problems during the discussion sessions that are held each week. The quasi-weekly quizzes will come directly out of the lectures and problems solved in class. The projects will combine fundamental physical concepts to model complex systems.

## General topics to be covered:

- 1) Deformation and measures of strain
- 2) Mechanical equilibrium and measures of stress
- 3) Analysis of stress, principle stresses, invariants, spherical and deviatoric stresses
- 4) Linearly-elastic constitutive laws, major mechanical constants, anisotropy
- 5) Composite materials and micromechanics
- 6) Design of materials and inverse problems
- 6) Non-linearly elastic material behavior
- 7) Elasto-plastic material behavior
- 8) Linear elastic fracture, stress concentration factors, asymptotic crack tip fields, propagation criteria, cyclic (fatigue) failure