

CE 231/MS C211 Mechanics of Solids

Instructor:

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Office hours: To be announced

Location and time:

544 Davis, MWF 9-10am.

Homework:

Homework will be assigned along the course. No late homework will be accepted. Assignments must be developed and submitted individually.

Solution sets, class handouts and different announcements will be posted in my Web home page (<http://www.ce.berkeley.edu/~armero>).

References:

There is no required textbook for the course; handouts will be distributed instead, for some (but not all) parts. I have put on reserve in the Engineering library the following references that cover the material of the course (and beyond):

1. Shames, I.H. & Cozzarelli, F.A. [1997] “Elastic and Inelastic Stress Analysis”, Taylor & Francis, Washington DC.
2. Malvern, L.E. [1969] “Introduction to the Mechanics of a Continuous Medium”, Prentice Hall, Englewood Cliffs, N.J.

I may put additional references on reserve when we look at more advanced and specific topics at the end of the course.

Grading system:

Grades will be based on the homework assignments, midterm and final exam.

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1. Mathematical preliminaries.
 - Vector and tensor algebra.
 - Tensor calculus.
2. Equilibrium.
 - The stress tensor: Cauchy's theorem.
 - Stress transformations.
 - The equations of motion: equilibrium.
3. Kinematics.
 - The strain tensor.
 - Strain transformations.
 - Compatibility.
4. Constitutive theory: elasticity.
 - Expended power and strain energy.
 - Linear elasticity.
5. Boundary-value problems of linear elasticity and their solution.
 - General formulation: uniqueness.
 - Some classical solution methods.
6. Theory of plasticity.
7. Theory of visco-elasticity.
8. Additional advanced topics (depending of class interests).