ME243 August 3:0

Continuum mechanics

Instructor

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Teaching Assistant

Email:

Department: Mechanical

Course Time:

Lecture venue:

Detailed Course Page:

Announcements

Brief description of the course

This is an advanced level (post graduate level) course on continuum mechanics. It deals with the fundamental principles governing the behavior of solids, fluids and other continua. A basic level course in Solid mechanics or Fluid mechanics is a prerequisite. Some background material on tensors (typically taught in our Maths course) is also assumed. Typically M. Tech students or Ph.D. students take this course in their third semester.

Prerequisites

ME242

Syllabus

Tensor analysis including tensor calculus, Kinematics, Lagrangian and Eulerian formulations, Dynamics, Balance laws including balance of mass and balance of Linear and Angular momentum, Cauchy principle. Constitutive laws, Material frame indifference, Hyperelasticity, Newtonian fluids, Linearized theory of elasticity, Thermomechanics including the first and second law of thermodynamics, Clausius Duhem inequality and its implications.

Course outcomes

Students learn a unified treatment of all materials that can be treated as continua including balance laws that are common to all continua, and constitutive laws and the constraints that they should satisfy.

Grading policy

Test: 30

Assignments: 20

Final Exam: 50.

Assignments

Resources

Foundations and Applications of Mechanics: Vol. I and II

Author: C. S. Jog

Publisher: Cambridge University Press, 2015.