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Micromechanics of composites

Instructor

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Email:

Department: Department of Aerospace Engineering

Course Time:

Lecture venue:

Detailed Course Page:

Announcements

Brief description of the course

This is an advanced graduate level course. Students should have a background in solid mechanics prior to taking this course.

Prerequisites

Solid mechanics, design and analysis of composites

Syllabus

Introduction to tensors, properties of tensors, concepts of isotropy and anisotropy, micromechanical homogenization theory, Eshelby's approach, self-consistent schemes, Mori-Tanaka Mean field theory, bounds on effective properties, concentric cylinder models, introduction to computational homogenization, introduction to damage mechanics, statistical aspects of microstructure

Course outcomes

Concepts of homogenization, representative volume element, effective properties of a heterogeneous medium

Grading policy

20% assignments, 30% midterms, 30% final exam, 20% term project

Assignments

Resources

1) Micromechanics of defects in solids, T. Mura 1982

2) Micromechanics of composite materials, Brett Bendnarcyk et al, 2012

3) Open literature