Introduction to Continuum Mechanics

MECHENG 7100

Credit Hours:
3.00 - 3.00

Course Levels:
Graduate (5000-8000 level)

Course Components:
Lecture

Course Description:
Continuum mechanics in Cartesian and general coordinates, vectors and tensors in indicial and direct notation, analysis of deformation and stress, balance principles.

Prerequisites and Co-requisites:
Prereq: 2020 (420) or 2040, and Math 2174, 2255 (255), or 2415 (415) or equiv; or Grad standing in Engineering; or permission of instructor.

Course Goals / Objectives:
- Ability to manipulate vectors and tensors using indicial and direct notation
- Understanding of the relationships between various kinematic tensors
- Understand the different stress tensors
- Understand how to use balance laws in their integral and differential forms
- Ability to read journal articles on continuum mechanics topics and understand the equations used in those articles

Course Topics:
- Vectors, tensors, and tensor calculus in indicial and direct notation
- Kinematic tensors for small and finite deformation
- Stress tensors
- Balance laws
- Example problems in linear elasticity and Newtonian fluid mechanics
Designation:
Elective