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Office Hours: 1:00-2:00 pm M, W or by appointment

Grading

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References

TOPICS

Continuum Theory
Stress Principles
  Review
Kinematics of Deformation and Motion
  Review
Constitutive Equations
  Generalized Hook’s Law for Anisotropic Materials
  Hook’s Law for Isotropic Media, Elastic Constants
Elasticity in Rectangular Coordinates
  Two Dimensional Problems in Elasticity
  Rectangular Coordinates: Plane Stress, Plane Strain, Generalized Plane Strain
  Stress Function Formulation of Plane Problems
  Inverse and Semi Inverse Solution
  Techniques for Bi-harmonic Equation
  Stresses and Displacements using Polynomial Expansions of Stress Function.
Fourier Series In Elasticity
  General Solution of Bi-harmonic Equation
  Real and Complex Form of Fourier Integral Theorem
  Application to infinite Domain Elasticity Problems
Elasticity in Polar Coordinate System
  Transformation of Plane Elasticity equations from Rectangular to Polar Coordinates
  Thick Walled Cylindrical Vessels Subjected to Pressure Loading
  Stress Concentration Due to Circular Hole
  Inclusion Problems (Micomechanics)
  Half plane problems
  Michell’s Problem of Concentrated Vertical and Horizontal Loads on Wedge
Uniqueness of Elasticity Solution and Non Dimensional Analysis
Introduction to Failure Criteria
  One Parameter Failure Models (Rankine Principal Stress, St. Venant, Principal Strain, Tresca Maximum Shear, Mises-Hencky, Distortion or Octahedral Shear Stress Theory)
  Mohr Theory of Failure and Two Parameter Mohr-Colomb Model of Failure.
Introduction to Fracture Mechanics
Special Topics (Project).
  Micromechanics of Fracture
  Viscoelasticity
  Granular Media
  Complex Variable analysis and application to singularity problems
Elasticity in 3D