



Theory of Elasticity for Plane-Strain, Plane-Stress Problems

Name of the PMRF student

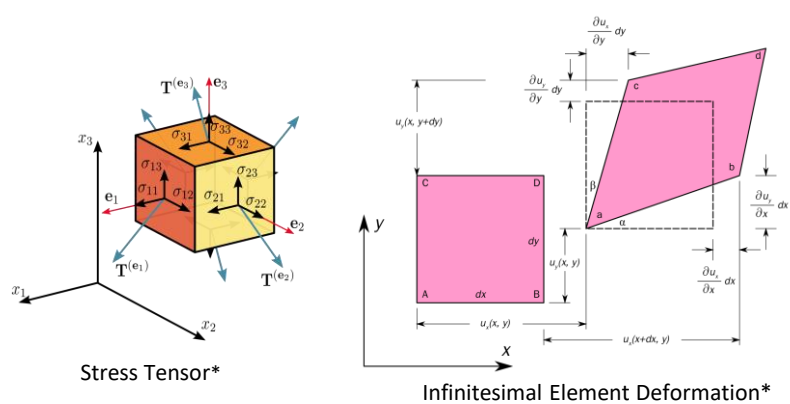
Anay Mohan Shembekar

Required background of the students taught

Any senior UG & first-year PG students in Mechanical/Aerospace/Civil Engineering who have completed an introductory course like Mechanics of Materials and wish to study mechanics using a more rigorous treatment, doing away with physical assumptions

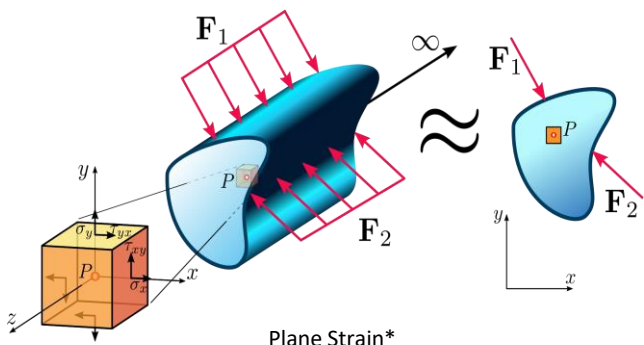
Online session coordinator

Will be chosen from the list of registrants



Stress Tensor*

Infinitesimal Element Deformation*



Plane Strain*

Details of the content of the module

This course introduces the elasticity theory and its application to engineering structures. The basic theory includes the definition of stress, strain and elastic energy; equilibrium and compatibility conditions; and the formulation of boundary value problems. We will also discuss solving elasticity equations using the stress function method for plane-stress, plane-strain problems.

1. Mathematical preliminaries
2. Force & Deformation: Traction, State of Stress at a point, Strain at a point & Hooke's Law
3. Fundamental Equations of Elasticity: Equilibrium equation, Compatibility equation
4. Plane Stress, Plane Strain
5. Airy Stress Function
6. Boundary Value Problems & solution approaches
7. Treatment of Elastic Rod, Rectangular Beam
8. Polar Coordinates, Axisymmetric Problems
9. Strain Energy
10. Selected BVP in Elasticity

Schedule of the module

Starts on 23rd Sept 2023 (Tentative)

Timings: Every Saturday & Sunday at 3pm

Total: 28 hours

Meeting link : Will be shared later

Contact email ID: issf.forum@gmail.com

Registration link:

Course Registration: Theory of Elasticity for Plane-Strain, Plane-Stress Problems

