

NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Mechanical Engineering - Advanced Strength of Materials

Subject Co-ordinator - Prof. S.K. Maiti

Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Stress and Strain Tensor

Lecture 2 - Stress and Strain Tensor (Continued) and Cauchy Formula for Traction

Lecture 3 - Examples on Calculation of Strains and Traction, Principal Stresses and Directions

Lecture 4 - Example on Calculation of Principal Stresses and Directions, Orthogonality of Principal Direction

Lecture 5 - Maximum Shear Stress and Octahedral Shear Stress, Deviatoric and Hydrostatic Stresses

Lecture 6 - Transformation of Stresses and Mohr Circle in 3-D

Lecture 7 - Mohr Circle (Continued)

Lecture 8 - Deformation, Rotation and Strain Tensors, Principal Strains, Deviatoric and Hydrostatic Strains

Lecture 9 - Strain Transformations, Strains in Polar Coordinates, Equilibrium Equations in 2-D

Lecture 10 - Equilibrium Equations in 2-D Polar Coordinates Plane Stress and Plane Strain Conditions

Lecture 11 - Stress-Strain Relations for Isotropic, Orthotropic and Anisotropic Materials Stress-Strain-Temperature

Lecture 12 - Relation between Elastic Constants and Strain Energy Densities Recap of Lectures 1 to 11

Lecture 13 - Stress Distribution in Thick Cylinder

Lecture 14 - Stresses due to Shrink Fitting

Lecture 15 - Stresses in Rotating Disc

Lecture 16 - Examples on Shrink Fitting and Rotating Disc

Lecture 17 - Torsion of Non-Circular Shaft

Lecture 18 - Torsion of Non-Circular Shaft (Continued)

Lecture 19 - Membrane Analogy for Torsion

Lecture 20 - Torsion of Thin Box Sections

Lecture 21 - Torsion of Box and Open Sections

Lecture 22 - Bending of Curved Bars

Lecture 23 - Bending of Curved Bars (Continued)

Lecture 24 - Theories of Failure

Lecture 25 - Theories of Failure (Continued)

Lecture 26 - Theories of Failure (Continued) and Their Applications, Griffith Theory of Brittle Fracture

Lecture 27 - Application of Griffith Theory, Irwin-Orowan Modification of Griffith Theory, Assessment of Effect

Lecture 28 - Theorems of Elasticity

Lecture 29 - Theorems of Elasticity (Continued)

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- Lecture 30 - Thermal Stress Distribution in Rectangular Sheet due to Symmetric and Asymmetric Temperature Field
- Lecture 31 - Thermal Stress Distribution in Cylinders
- Lecture 32 - Unsymmetrical Bending
- Lecture 33 - Shear Centre
- Lecture 34 - Plate Bending
- Lecture 35 - Plate Bending (Continued)
- Lecture 36 - Examples on Plate Bending
- Lecture 37 - Approximate Solutions for Bending of Rectangular and Circular Plates
- Lecture 38 - Thin Shells of Revolution
- Lecture 39 - Beam on Elastic Foundation
- Lecture 40 - Application of Beam on Elastic Foundation Analysis to Pressure Vessels for Calculation of Displacements