

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

NPTEL Video Course - Metallurgy and Material Science - NOC:Mechanical Behaviour of Materials - Part I

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Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction
- Lecture 2 - Origin of Elasticity
- Lecture 3 - Stress as a Tensor
- Lecture 4 - Principal Stress
- Lecture 5 - Mohr's Circle
- Lecture 6 - Stress-Strain Relation
- Lecture 7 - Viscoelasticity
- Lecture 8 - Tensile Testing
- Lecture 9 - Universal Testing Machine
- Lecture 10 - Flow Stress
- Lecture 11 - Yield Criteria: Basics
- Lecture 12 - Yield Criteria: Tresca, Von-Mises
- Lecture 13 - Effective Stress_Effective Strain
- Lecture 14 - Plastic Instability
- Lecture 15 - Effect of Strain-rate and Temperature
- Lecture 16 - Dislocations: Discovery
- Lecture 17 - Dislocations: Fundamentals
- Lecture 18 - Dislocations: Characteristics
- Lecture 19 - Stress and Strain Fields of Dislocations
- Lecture 20 - Energy of Dislocations
- Lecture 21 - Dislocation Motion Glide
- Lecture 22 - Cross-slip of Dislocations
- Lecture 23 - Climb motion of Dislocations
- Lecture 24 - Steps in Dislocations
- Lecture 25 - Slip Systems
- Lecture 26 - More on Slip Systems
- Lecture 27 - Critical Resolved Shear Stress
- Lecture 28 - Dislocation Interactions
- Lecture 29 - Image Forces

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- Lecture 30 - Partial Dislocations
- Lecture 31 - Strengthening Mechanisms
- Lecture 32 - Precipitation Strengthening: Basic Criteria
- Lecture 33 - Precipitation Strengthening: Precipitate Characteristics
- Lecture 34 - Precipitation Strengthening: Mechanisms
- Lecture 35 - Effect of Temperature: Dispersion Strengthening
- Lecture 36 - Solid Solution Strengthening: Basics
- Lecture 37 - Solid Solution Strengthening: Interaction with Dislocations
- Lecture 38 - Solid Solution Strengthening: Yield Point Phenomenon
- Lecture 39 - Grain Boundary Strengthening
- Lecture 40 - Strain Hardening: Single Xtal and Poly Crystal Deformation, Tylor Hardening
- Lecture 41 - Strain Hardening: Dislocation Multiplication, Intersection and Locks
- Lecture 42 - Summary of Strengthening Mechanisms
- Lecture 43 - Hardness Testing
- Lecture 44 - Impact Testing
- Lecture 45 - Mechanical Behaviour of Composites