

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

NPTEL Video Course - Metallurgy and Material Science - NOC:Surface Engineering for Corrosion and Wear Resistance

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Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Structure of Solids  
Lecture 2 - Microstructure of Solids  
Lecture 3 - Defects in Crystalline Solids  
Lecture 4 - Surface and Surface Energy  
Lecture 5 - Surface Properties-due to mechanical activation  
Lecture 6 - Surface dependent physical and chemical property  
Lecture 7 - Surface Dependent Properties and Surface initiated Degradation  
Lecture 8 - Fatigue  
Lecture 9 - Wear Part - I  
Lecture 10 - Wear Part - II  
Lecture 11 - Wear Part - III  
Lecture 12 - Corrosion - I  
Lecture 13 - Corrosion - II  
Lecture 14 - Corrosion - III  
Lecture 15 - Corrosion - IV  
Lecture 16 - Corrosion - V  
Lecture 17 - Classification of Surface engineering  
Lecture 18 - Strengthening of metals  
Lecture 19 - Strengthening of Non-Metals  
Lecture 20 - Diffusive transformation in Steel  
Lecture 21 - Non-Diffusive transformation in Steel  
Lecture 22 - Shot Peening  
Lecture 23 - Shot Peening and Rolling  
Lecture 24 - Flame Hardening and Induction Hardening  
Lecture 25 - Case Carburizing  
Lecture 26 - Liquid Carburizing and Gas Carburizing  
Lecture 27 - Gas Nitriding  
Lecture 28 - Liquid and Salt Bath Nitriding  
Lecture 29 - Plasma Nitriding and Ion Implantation

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- Lecture 30 - Heat treatment after carburizing and Nitriding
- Lecture 31 - Diffusion Coating Principle
- Lecture 32 - Diffusion Coating Processes
- Lecture 33 - Thick Coating by Cladding
- Lecture 34 - High Temperature Degradation
- Lecture 35 - Corrosion Prevention
- Lecture 36 - Chemical Conversion Coating
- Lecture 37 - Electroconversion Coating
- Lecture 38 - Electro and Electroless Deposition Process
- Lecture 39 - Hot Dipping - I
- Lecture 40 - Hot Dipping - II
- Lecture 41 - Thermal Spray Deposition - I
- Lecture 42 - Thermal Spray Deposition - II
- Lecture 43 - Thermal Spray Deposition - III
- Lecture 44 - Thermal Spray Deposition - IV
- Lecture 45 - Physical Vapor Deposition (PVD)
- Lecture 46 - Sputtering
- Lecture 47 - Chemical Vapor Deposition (CVD)
- Lecture 48 - Composite Coating
- Lecture 49 - Ion Implantation - I
- Lecture 50 - Ion Implantation - II
- Lecture 51 - Electron Beam Welding
- Lecture 52 - Electron Beam Surface engineering
- Lecture 53 - Laser Materials Processing
- Lecture 54 - Laser Assisted Materials Processing
- Lecture 55 - Laser Surface Engineering
- Lecture 56 - Laser Surface Engineering with Laser surface hardening and laser surface melting
- Lecture 57 - Laser Surface Alloying
- Lecture 58 - Laser Surface Cladding
- Lecture 59 - Surface Damage - Case Studies
- Lecture 60 - Overview and Conclusion