

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

NPTEL Video Course - Physics - NOC:Foundations of Classical Electrodynamics

Subject Co-ordinator - Prof. Samudra Roy

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Vector analysis, Scalar and vector fields, vector identities  
Lecture 2 - Vector Analysis (Continued...)  
Lecture 3 - Use of Levi-Civita Symbol, Coordinate system  
Lecture 4 - Coordinate system, Orthogonal Transformation  
Lecture 5 - Spherical Coordinate system, Line, surface and volume element  
Lecture 6 - Line, surface and volume element (Continued...)  
Lecture 7 - Line, surface and volume integral  
Lecture 8 - Differential calculus, Gradient  
Lecture 9 - Gradient operator, Concept of divergence  
Lecture 10 - Divergence operator, Divergence Theorem  
Lecture 11 - Curl operator, Stokes Theorem  
Lecture 12 - Gradient, Divergence and Curl (A recap), Vector identities  
Lecture 13 - Curvilinear coordinate system  
Lecture 14 - Curvilinear coordinate system (Continued...)  
Lecture 15 - Curvilinear coordinate system (Continued...)  
Lecture 16 - Delta Function  
Lecture 17 - Delta Function (Continued...)  
Lecture 18 - Helmholtz's Theorem  
Lecture 19 - Helmholtz's Theorem(Recap), Tutorial  
Lecture 20 - Tutorial (Continued...)  
Lecture 21 - Concept of charge, Charge density  
Lecture 22 - Coulomb's Law  
Lecture 23 - Coulomb's Law (Continued...), Charge distribution  
Lecture 24 - Charge distribution problem, Gauss's Law  
Lecture 25 - Topics More on Gauss's Law  
Lecture 26 - Application of Gauss's Law  
Lecture 27 - Electrostatic potential  
Lecture 28 - Electrostatic potential (Continued...)  
Lecture 29 - Electrostatic energy

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- Lecture 30 - Electrostatic energy (Continued...)
- Lecture 31 - Electrostatic energy calculation
- Lecture 32 - Electrostatic dipole
- Lecture 33 - Electric dipole (Continued...)
- Lecture 34 - Multipole expansion
- Lecture 35 - Monopole and Dipole moment
- Lecture 36 - Quadrupole moment
- Lecture 37 - Dipole and Quadrupole moment (Continued...)
- Lecture 38 - Conductor
- Lecture 39 - Conductor (Continued...)
- Lecture 40 - Boundary condition
- Lecture 41 - Electrostatic pressure, Capacitor
- Lecture 42 - Energy of the Capacitor, Dielectric
- Lecture 43 - Dielectric (Continued...)
- Lecture 44 - Displacement Vector
- Lecture 45 - Electrostatic boundary value problem
- Lecture 46 - Electrostatic boundary value problem (Continued...)
- Lecture 47 - Electrostatic boundary value problem (Continued...), Image method
- Lecture 48 - Image method (Continued...)
- Lecture 49 - Charge particle in magnetic field
- Lecture 50 - Biot-Savart Law
- Lecture 51 - Application of Biot-Savart Law
- Lecture 52 - Ampere's Law
- Lecture 53 - Application of Ampere's Law
- Lecture 54 - Magnetic vector potential
- Lecture 55 - Magnetic vector potential (Continued...)
- Lecture 56 - Magnetic dipole moment
- Lecture 57 - Magnetic dipole moment (Continued...)
- Lecture 58 - Torque and potential energy of magnetic dipole, Magnetization
- Lecture 59 - Bound Current
- Lecture 60 - Magnetic materials
- Lecture 61 - Electromagnetic Induction
- Lecture 62 - Self and mutual inductance
- Lecture 63 - Wave equation, Maxwell's Equation
- Lecture 64 - Maxwells Equation (Continued...)
- Lecture 65 - Maxwells Equation: a complete overview
- Lecture 66 - Maxwells Equation: a complete overview (Continued...)
- Lecture 67 - Lorentz Gauge, Maxwell's wave equation
- Lecture 68 - Maxwell's wave equation (Coninued...)

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- Lecture 69 - Maxwell's Equation in matter
- Lecture 70 - Maxwell's Equation in matter (Continued...)
- Lecture 71 - Tutorial 2 (Electrostatic)
- Lecture 72 - Tutorial 3 (Magnetostatic)
- Lecture 73 - Tutorial 4 (Magnetostatic and EM Wave)