

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

NPTEL Video Course - Physics - NOC:Mathematics Methods in Physics - I

Subject Co-ordinator - Prof. Samudra Roy

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Set, Group, Field, Ring

Lecture 2 - Vector Space

Lecture 3 - Span, Linear combination of vectors

Lecture 4 - Linearly dependent and independent vector, Basis

Lecture 5 - Dual Space

Lecture 6 - Inner Product

Lecture 7 - Schwarz Inequality

Lecture 8 - Inner product space, Gram-Schmidt Ortho-normalization

Lecture 9 - Projection operator

Lecture 10 - Transformation of Basis

Lecture 11 - Transformation of Basis (Continued...)

Lecture 12 - Unitary transformation, Similarity Transformation

Lecture 13 - Eigen Value, Eigen Vectors

Lecture 14 - Normal Matrix

Lecture 15 - Diagonalization of a Matrix

Lecture 16 - Hermitian Matrix

Lecture 17 - Rank of a Matrix

Lecture 18 - Cayley - Hamilton Theorem, Function space

Lecture 19 - Metric Space, Linearly dependent - independent functions

Lecture 20 - Linearly dependent & independent functions (Continued...), Inner Product of functions

Lecture 21 - Orthogonal functions

Lecture 22 - Delta Function, Completeness

Lecture 23 - Fourier

Lecture 24 - Fourier Series (Continued...)

Lecture 25 - Parseval Theorem, Fourier Transform

Lecture 26 - Parseval Relation, Convolution Theorem

Lecture 27 - Polynomial space, Legendre Polynomial

Lecture 28 - Monomial Basis, Factorial Basis, Legendre Basis

Lecture 29 - Complex Numbers

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- Lecture 30 - Geometrical interpretation of complex numbers
- Lecture 31 - de Moivre's Theorem
- Lecture 32 - Roots of a complex number
- Lecture 33 - Set of complex no, Stereographic projection
- Lecture 34 - Complex Function, Concept of Limit
- Lecture 35 - Derivative of Complex Function, Cauchy-Riemann Equation
- Lecture 36 - Analytic Function
- Lecture 37 - Harmonic Conjugate
- Lecture 38 - Polar form of Cauchy-Riemann Equation
- Lecture 39 - Multi-valued function and Branches
- Lecture 40 - Complex Line Integration, Contour, Regions
- Lecture 41 - Complex Line Integration (Continued...)
- Lecture 42 - Cauchy-Goursat Theorem
- Lecture 43 - Application of Cauchy-Goursat Theorem
- Lecture 44 - Cauchy's Integral Formula
- Lecture 45 - Cauchy's Integral Formula (Continued...)
- Lecture 46 - Series and Sequence
- Lecture 47 - Series and Sequence (Continued...)
- Lecture 48 - Circle and radius of convergence
- Lecture 49 - Taylor Series
- Lecture 50 - Classification of singularity
- Lecture 51 - Laurent Series, Singularity
- Lecture 52 - Laurent series expansion
- Lecture 53 - Laurent series expansion (Continued...), Concept of Residue
- Lecture 54 - Classification of Residue
- Lecture 55 - Calculation of Residue for quotient from
- Lecture 56 - Cauchy's Residue Theorem
- Lecture 57 - Cauchy's Residue Theorem (Continued...)
- Lecture 58 - Real Integration using Cauchy's Residue Theorem
- Lecture 59 - Real Integration using Cauchy's Residue Theorem (Continued...)
- Lecture 60 - Real Integration using Cauchy's Residue Theorem (Continued...)