NPTEL Video Course - Mathematics - NOC:Mathematical Methods in Physics 1

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

Lecture 30 - Normal operators
Lecture 31 - Similarity and Unitary transformations
Lecture 32 - Matrix representations
Lecture 33 - Eigenvalues and Eigenvectors of matrices
Lecture 34 - Defective matrices
Lecture 35 - Eigenvalues and eigenvectors: useful results
Lecture 36 - Transformation of Basis
Lecture 37 - A class of invertible matrices
Lecture 38 - Diagonalization of matrices
Lecture 39 - Diagonalizability of matrices
Lecture 40 - Functions of matrices
Lecture 41 - SHM and waves
Lecture 42 - Periodic functions
Lecture 43 - Average value of a function
Lecture 44 - Piecewise continuous functions
Lecture 45 - Orthogonal basis: Fourier series
Lecture 46 - Fourier coefficients
Lecture 47 - Dirichlet Conditions
Lecture 48 - Complex Form of Fourier Series
Lecture 49 - Other intervals: arbitrary period
Lecture 50 - Even and Odd Functions
Lecture 51 - Differentiating Fourier series
Lecture 52 - Parseval's theorem
Lecture 53 - Fourier series to Fourier transforms
Lecture 54 - Fourier Sine and Cosine transforms
Lecture 55 - Parseval's theorem for Fourier series
Lecture 56 - Ordinary Differential equations
Lecture 57 - First order ODEs
Lecture 58 - Linear first order ODEs
Lecture 59 - Orthogonal Trajectories
Lecture 60 - Exact differential equations
Lecture 61 - Special first order ODEs
Lecture 62 - Solutions of linear first-order ODEs
Lecture 63 - Revisit linear first-order ODEs
Lecture 64 - ODEs in disguise
Lecture 65 - 2nd order Homogeneous linear equations with constant coefficients
Lecture 66 - The use of a known solution to find another
Lecture 67 - An alternate approach to auxiliary equation
Lecture 68 - Inhomogeneous second order equations

Lecture 69 - Methods to find a Particular solution
Lecture 70 - Successive Integration of two first order equations
Lecture 71 - Illustrative examples
Lecture 72 - Variation of Parameters
Lecture 73 - Vibrations in mechanical systems
Lecture 74 - Forced Vibrations
Lecture 75 - Resonance
Lecture 76 - Linear Superposition
Lecture 77 - Laplace Transform (LT)
Lecture 78 - Basic Properties of Laplace Transforms
Lecture 79 - Step functions, Translations, and Periodic functions
Lecture 80 - The Inverse Laplace Transform
Lecture 81 - Convolution of functions
Lecture 82 - Solving ODEs using Laplace transforms
Lecture 83 - The Dirac Delta function
Lecture 84 - Properties of the Dirac Delta function
Lecture 85 - Green's function method
Lecture 86 - Green's function method: Boundary value problem
Lecture 87 - Power series method
Lecture 88 - Power series solutions about an ordinary point
Lecture 89 - Initial value problem: power series solution
Lecture 90 - Frobenius method for regular singular points