NPTEL Video Course - Mechanical Engineering - Mathematical Methods in Engineering and Science

Subject Co-ordinator - Dr. Bhaskar Dasgupta

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Introduction
Lecture 2 - Basic Ideas of Applied Linear Algebra
Lecture 3 - Systems of Linear Equations
Lecture 4 - Square Non-Singular Systems
Lecture 5 - Ill-Conditioned and Ill-Posed Systems
Lecture 6 - The Algebraic Eigenvalue Problem
Lecture 7 - Canonical Forms, Symmetric Matrices
Lecture 8 - Methods of Plane Rotations
Lecture 9 - Householder Method, Tridiagonal Matrices
Lecture 10 - QR Decomposition, General Matrices
Lecture 11 - Singular Value Decomposition
Lecture 12 - Vector Space
Lecture 13 - Multivariate Calculus
Lecture 14 - Vector Calculus in Geometry
Lecture 15 - Vector Calculus in Physics
Lecture 16 - Solution of Equations
Lecture 17 - Introdcution to Optimization
Lecture 18 - Multivariate Optimization
Lecture 19 - Constrained Optimization
Lecture 20 - Constrained Optimization
Lecture 21 - Interpolation
Lecture 22 - Numerical Integration
Lecture 23 - Numerical Solution of ODE's as IVP
Lecture 24 - Boundary Value Problems, Question of Stability in IVP Solution
Lecture 25 - Stiff Differential Equations, Existence and Uniqueness Theory
Lecture 26 - Theory of First Order ODE's
Lecture 27 - Linear Second Order ODE's
Lecture 28 - Methods of Linear ODE's
Lecture 29 - ODE Systems

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

```
Lecture 30 - Stability of Dynamic Systems
Lecture 31 - Series Solutions and Special Functions
Lecture 32 - Sturm-Liouville Theory
Lecture 33 - Approximation Theory and Fourier Series
Lecture 34 - Fourier Integral to Fourier Transform, Minimax Approximation
Lecture 35 - Separation of Variables in PDE's, Hyperbolic Equations
Lecture 36 - Parabolic and Elliptic Equations, Membrane Equation
Lecture 37 - Analytic Functions
Lecture 38 - Integration of Complex Functions
Lecture 39 - Singularities and Residues
Lecture 40 - Calculus of Variations
```

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in