NPTEL Video Course - Mathematics - NOC:Ordinary Differential Equations

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

Lecture 1 - Vector Spaces
Lecture 2 - Linear Transformation
Lecture 3 - Matrices
Lecture 4 - Calculus in Several Variable
Lecture 5 - Lipchitz Continuity
Lecture 6 - Cauchy-Schwatz and Gronwall Inequality
Lecture 7 - Ordinary Differential Equations: Introduction
Lecture 8 - Differential Inequalities
Lecture 9 - 2nd Order Constant coefficient linear equations
Lecture 10 - Picard Existence and Uniqueness Theorem
Lecture 11 - Linear System
Lecture 12 - Well-Posedness of a ODE
Lecture 13 - Linear System - 1
Lecture 14 - Linear System - 2
Lecture 15 - Fundamental Matrix
Lecture 16 - Exponential of a Linear Operator
Lecture 17 - Fundamental theorem of linear Systems
Lecture 18 - Higher Dimensional Matrix Exponential - 1
Lecture 19 - Higher Dimensional Matrix Exponential - 2
Lecture 20 - Method of Eigenvalue
Lecture 21 - Method of Eigenvalue (Continued...)
Lecture 22 - Maximal Interval of Existence
Lecture 23 - Maximal Interval of Existence: Worked out examples
Lecture 24 - Periodic Linear System
Lecture 25 - Asymptotic behavior of solution to linear system - I
Lecture 26 - Asymptotic behavior of solution to linear system - II
Lecture 27 - Asymptotic Behavior of Linear Systems - III
Lecture 28 - Exact and Adjoint equations
Lecture 29 - Sturm Comparison Theory

Lecture 30 - Oscillation Theory - 2
Lecture 31 - Linear Boundary Value Problem
Lecture 32 - Maximum Principle
Lecture 33 - Sturm Liouville Theory - 1
Lecture 34 - Sturm Liouville Theory - 2
Lecture 35 - Periodic Sturm Liouville Problem
Lecture 36 - Eigenfunction Expansion
Lecture 37 - Stability in the sense of Lyapunov - I
Lecture 38 - Stability in the sense of Lyapunov - II
Lecture 39 - Lyapunov Direct method
Lecture 40 - Linear two-dimensional phase space dynamics (Continued...)
Lecture 41 - Phase Portrait for Planar Systems