

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

NPTEL Video Course - Mechanical Engineering - Nonlinear Vibration

Subject Co-ordinator - Prof. S.K. Dwivedy

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Introduction of Nonlinear systems
- Lecture 2 - Review of Linear vibrating systems
- Lecture 3 - Phenomena associated with Nonlinear systems
- Lecture 4 - Commonly observed Phenomena in Nonlinear systems
- Lecture 5 - Force and Moment based Approach
- Lecture 6 - Energy based approach Extended Hamilton's principle and Lagrange Principle
- Lecture 7 - Derivation of Equation of motion of nonlinear discrete system (More examples)
- Lecture 8 - Derivation of Equation of motion of nonlinear continuous system - 1
- Lecture 9 - Derivation of Equation of motion of nonlinear continuous system - 2
- Lecture 10 - Ordering of nonlinear Equation of motion
- Lecture 11 - Qualitative Analysis Straight forward expansion
- Lecture 12 - Numerical method Straight forward expansion
- Lecture 13 - Lindstedt Poincare's technique
- Lecture 14 - Method of multiple scales
- Lecture 15 - Method of Harmonic balance
- Lecture 16 - Method of averaging
- Lecture 17 - Generalized Method of averaging
- Lecture 18 - Krylov-Bogoliubov-Mitropolski technique
- Lecture 19 - Incremental harmonic balance method and Intrinsic multiple scale harmonic balance method
- Lecture 20 - Modified Lindstedt Poincare's technique
- Lecture 21 - Stability and Bifurcation of Fixed-point response - 1
- Lecture 22 - Stability and Bifurcation of Fixed-point response - 2
- Lecture 23 - Stability and Bifurcation of Fixed-point response - 3
- Lecture 24 - Stability and Bifurcation of Fixed-point response - 4
- Lecture 25 - Stability Analysis of Periodic response
- Lecture 26 - Bifurcation of Periodic response And Introduction to quasi-periodic and Chaotic response
- Lecture 27 - Quasi-Periodic and Chaotic response
- Lecture 28 - Numerical methods to obtain roots of characteristic equation and time response
- Lecture 29 - Numerical methods to obtain time response

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

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- Lecture 30 - Numerical methods to obtain frequency response
- Lecture 31 - Free Vibration of Single degree of freedom Nonlinear systems with Cubic and quadratic nonlinearities
- Lecture 32 - Free Vibration of Single degree of freedom Nonlinear systems with Cubic and quadratic nonlinearities
- Lecture 33 - Free Vibration of multi- degree of freedom Nonlinear systems with Cubic and quadratic nonlinearities
- Lecture 34 - Forced nonlinear Vibration Single degree of freedom Nonlinear systems with Cubic nonlinearities
- Lecture 35 - Forced nonlinear Vibration Single and multi- degree of freedom Nonlinear systems
- Lecture 36 - Nonlinear Forced-Vibration of Single and Multi Degree-of-Freedom System
- Lecture 37 - Analysis of Multi- degree of freedom system
- Lecture 38 - Nonlinear Vibration of Parametrically excited system
- Lecture 39 - Nonlinear Vibration of Parametrically excited system
- Lecture 40 - Nonlinear Vibration of Parametrically excited system with internal resonance