

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

NPTEL Video Course - Civil Engineering - NOC:Elastic Stability of Structures

Subject Co-ordinator - Prof. Sarat Kumar Panda

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Basic concepts of buckling and introduction to equilibrium approach
- Lecture 2 - Introduction to energy and imperfection approach
- Lecture 3 - Introduction to different types of buckling
- Lecture 4 - Weighted residual methods in structural mechanics
- Lecture 5 - Weighted residual methods in structural mechanics (Continued...)
- Lecture 6 - Introduction to the strong and weak forms of GDE
- Lecture 7 - Variational method: Derivation of Euler Lagrange equation
- Lecture 8 - Delta operator in variational method for finding GDE and Boundary conditions
- Lecture 9 - Euler lagrange equation for functional having different dependent variables
- Lecture 10 - Brachistochrone problem
- Lecture 11 - Rayleigh-Ritz method
- Lecture 12 - Extension of Rayleigh-Ritz method and Galerkin's method
- Lecture 13 - Single DOF stability model
- Lecture 14 - Single DOF stability model and model having imperfection
- Lecture 15 - Large deflection theory for stability analysis of rigid body stability models
- Lecture 16 - Two DOF rigid body stability models
- Lecture 17 - Snap through stability model and model of imperfect geometry
- Lecture 18 - Weak form solution for hinged-hinged and fixed-fixed column
- Lecture 19 - Weak form solution for fixed-free and fixed-hinged column
- Lecture 20 - Strong form solution for hinged-hinged column
- Lecture 21 - Strong form solution for fixed-fixed and fixed-free column
- Lecture 22 - Critical load for column with elastic support
- Lecture 23 - Boundary conditions for column with general case of elastically supported ends
- Lecture 24 - Critical load for portal frame with column hinged at base
- Lecture 25 - Critical load for portal frame with column fixed at base
- Lecture 26 - Element stiffness matrix for beam-column
- Lecture 27 - Stability analysis of frames by matrix stiffness method
- Lecture 28 - Critical load of Euler column: Large deflection theory
- Lecture 29 - Critical load of Euler column with initial imperfection

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- Lecture 30 - Load deflection curve for beam-column: GDE approach
- Lecture 31 - Load deflection curve for beam-column: Energy approach
- Lecture 32 - General expression of elastic curve for beam-column
- Lecture 33 - Beam-column with several lateral and continuous loads
- Lecture 34 - Bending of beam-column by end couples
- Lecture 35 - Three moment equation for continuous beam-column
- Lecture 36 - Moment equation for continuous beam-column with intermediate column
- Lecture 37 - Beam-column on Elastic Foundation
- Lecture 38 - St Venant Torsion and Non-uniform Torsion
- Lecture 39 - Torsional Buckling
- Lecture 40 - Torsional Buckling and Torsional Flexural Buckling
- Lecture 41 - Torsional Flexural Buckling of Column Having Different Boundary Conditions
- Lecture 42 - Rayleigh-Ritz method for Torsional Flexural Buckling of Column
- Lecture 43 - Introduction to Plate Buckling and Small Deflection Theory
- Lecture 44 - Governing Differential Equation of Plate Buckling Using Small Deflection Theory
- Lecture 45 - Governing Differential Equation of Plate Buckling Using Small Deflection Theory (Continued...)
- Lecture 46 - Critical Load of Plate Using Equilibrium Approach
- Lecture 47 - Critical Load of Plate Using Energy Approach
- Lecture 48 - Critical Load of Plates with Different End Conditions: Energy Approach and Galerkin's
- Lecture 49 - F-w Formulation For Plate Buckling
- Lecture 50 - Critical load and Post Buckling Behaviour of Plate Using F-w Formulation
- Lecture 51 - Governing Differential Equation of Shell Buckling by Using Small Deflection Theory
- Lecture 52 - Governing Differential Equation of Shell Buckling by Using Small Deflection Theory (Continued...)
- Lecture 53 - Governing Differential Equation of Shell Buckling: Donnell's Equation
- Lecture 54 - Solution of Donnell's Equation for Finding Critical Load
- Lecture 55 - Governing Differential Equation of Shell Buckling by Using Finite Deflection Theory
- Lecture 56 - Post Buckling Behaviour of an Imperfect Axially Compressed Cylindrical Shell Panel
- Lecture 57 - Governing Differential Equation for the deflection curve of a thin bar
- Lecture 58 - Critical load of a two-hinged and fixed-fixed circular arch
- Lecture 59 - Inelastic Buckling Analysis of Column
- Lecture 60 - Inelastic Buckling Analysis of Column (Continued...)