

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

NPTEL Video Course - Civil Engineering - NOC:FEM and Constitutive Modelling in Geomechanics

Subject Co-ordinator - Prof. K Rajagopal

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introductory lecture and course outline
- Lecture 2 - Matrix algebra and Gauss elimination method
- Lecture 3 - Development of equilibrium equations for 1-d systems
- Lecture 4 - Development of equilibrium equations for 2-d bar elements and truss structures
- Lecture 5 - Development of equilibrium equations for beam elements
- Lecture 6 - Virtual work and principle of stationary potential energy
- Lecture 7 - Introduction to Rayleigh-Ritz Method
- Lecture 8 - Use of GEOFEM finite element program - Part I
- Lecture 9 - Use of GEOFEM finite element program - Part II
- Lecture 10 - Stresses and strains in continuum
- Lecture 11 - 2-dimensional approximations of continuum
- Lecture 12 - Analysis of continuum systems
- Lecture 13 - 3-node Constant Strain Triangle
- Lecture 14 - Classical methods for developing shape functions
- Lecture 15 - Numerical integration techniques
- Lecture 16 - Isoparametric Elements - Part I
- Lecture 17 - Isoparametric Elements - Part II
- Lecture 18 - Isoparametric calculations for stiffness and load vectors
- Lecture 19 - Force vector due to surface traction
- Lecture 20 - Patch test and Finite Element Modelling
- Lecture 21 - GEOFEM - Part III
- Lecture 22 - In situ earth pressures, construction and excavation sequences
- Lecture 23 - Joint and interface element modelling
- Lecture 24 - Modelling of interfaces - Joint Elements
- Lecture 25 - Mapped infinite elements for semi-infinite soil medium
- Lecture 26 - Some observations of soil behaviour and stress invariants
- Lecture 27 - Nonlinear analysis technique - 1
- Lecture 28 - Nonlinear analysis technique - 2
- Lecture 29 - Nonlinear analysis technique - 3

---

Get DIGIMAT For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

<http://www.digimat.in>

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

---

- Lecture 30 - Bilinear elastic models
- Lecture 31 - Nonlinear elastic and hyperbolic models
- Lecture 32 - Modified hyperbolic model and determination of material parameters
- Lecture 33 - Stress correction procedures in finite element analysis
- Lecture 34 - Numerical examples on working with modified hyperbolic models
- Lecture 35 - Some Limit solutions in geotechnical engineering
- Lecture 36 - Elastic - Plastic Constitutive Matrix
- Lecture 37 - Nonassociated Elastic - Plastic Joint Element
- Lecture 38 - Introduction to consolidation and dynamic analysis
- Lecture 39 - Cam Clay models
- Lecture 40 - Modified cam clay models
- Lecture 41 - FEM in Geotechnical applications
- Lecture 42 - Soil behaviour and An Introduction to the Existing Soil Models
- Lecture 43 - Simulation of soil liquefaction using FLAC
- Lecture 44 - Mitigation of soil liquefaction using granular columns