ADVANCED METHODS OF STRUCTURAL ANALYSIS

Course Code: 13CE 2204 **L P C**
4 0 3

Course Outcomes:
At the end of the course, the student will be able to :
CO1 : Analyse beams and building frames by flexibility method.
CO2 : Analyse beams and building frames by stiffness method.
CO3 : Apply the concept of ILDs for beams and trusses.
CO4 : Analyse cables and suspension bridges
CO5 : Apply Rayleigh Ritz method and Galerkin's method for beams and bars

UNIT-I
Flexibility Method: Analysis of Indeterminate beams, Frames and trusses by flexibility matrix method (upto maximum Static indeterminacy of 3 and support settlements not included).

UNIT-II
Stiffness Method: Analysis of Indeterminate beams, frames and trusses by stiffness matrix method (up to maximum Kinematic indeterminacy of 3 and support settlements not included).

UNIT-III
Influence lines: Analysis of indeterminate beams, two hinged arches, three hinged arches, Pratt type of trusses using influence lines.

UNIT-IV
Cables and Suspension Bridges: Introduction, Equation of the cable, General Cable theorem, horizontal reaction for uniformly loaded cable, Tension in the cable supported at same and different levels, lengths of the cable when supported at the same level. Temperature effect on the cable.

UNIT-V

Rayleigh Ritz method: Analysis of axially loaded bars and beams by Rayleigh Ritz method.

Gelarkin's method: Analysis of axially loaded bars and beams by Gelarkin's method.

TEXT BOOKS

1. G.S. Pandit & S.P. Gupta, *"Structural Analysis – A matrix approach"*, 2nd Edition, Tata Mc Grah Hill Companies, 2011.

2. S.B. Junarkar, *"Mechanics of Structures",* 3rd Edition, Dhanpat Rai Publications, 2011.

REFERENCES

1. Devdas Menon, *"Structural Analysis"*, 2nd Edition, Narosa Publications, 2012.

2. V.K. Manicka Selvam, *"Finite Element Premier",* 3rd Edition, Dhanapat Rai Publications, 2011.

3. S. Ramamrutham & R. Narayanan, *"Theory of Structures",* 9th Edition, Dhanapat Rai Publications, 2012.

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