16CE303 STRUCTURAL ANALYSIS - II

Hours Per Week :

L	T	P	C
3	1	-	4

Total Hours :

L	T	P	WA/RA	SSH/HSH	CS	SA	S	BS
45	15	-	20	40	6	12	2	3
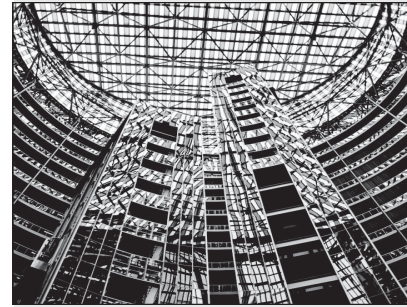
Course Description and Objectives:

This course is offered to calculate the reaction of a stastically in determinate structures by using different methods and to understand the behaviour of arches. The objective of the course to analyse continuous beams and multi-storey frames by various methods like slope deflection, moment distribution and Kani's method.

Course Outcomes:

Students will be able to:

- analyze multistoried structures.
- analyze three hinged arches and two hinged arches.

SKILLS:

- ✓ *Determine slope and deflection of beams.*
- ✓ *Determine internal stresses under loading.*
- ✓ *Perform analysis of framed structures for different loading case.*
- ✓ *Analyse the arches for different support conditions.*
- ✓ *Justification of sway in structures.*

UNIT - 1   **L-9, T-3**

SLOPE DEFLECTION METHOD: Slope-deflection equations, Principles of the method, Applications of the method to the analysis of continuous beams and portal frames (Single bay, single storey with vertical legs with outside sway).

ACTIVITIES:

o *Calculate the bending moments and shear forces for a continuous and portal frames using slope deflection method.*

UNIT - 2   **L-9, T-3**

MOMENT DISTRIBUTION METHOD: Principles of the method, Application of the method to analysis of continuous beams and portal frames (Single bay, single storey with vertical legs only) without sway.

UNIT - 3   **L-9, T-3**

MULTI STOREY FRAMES (APPROXIMATE METHODS): Portal method and cantilever method for lateral loads.

o *Calculate the bending moments and shear forces for a continuous and portal frames using moment distribution method.*

UNIT - 4   **L-9, T-3**

KANI'S METHOD: Principles of the method, Application to continuous beams and portal frames(single bay, single storey with vertical legs only) without and with side-sway.

o *Analyze the multi storied buildings using approximate methods.*

UNIT - 5   **L-9, T-3**

THREE-HINGED ARCHES: Introduction, Eddy's theorem for bending moment, Parabolic arch, Circular arch, Horizontal thrust, Arch supported at different levels.

TWO-HINGED ARCHES: Introduction, Horizontal thrust, Circular and parabolic arches carrying concentrated load and uniformly distributed load, Effect of change in temperature, Introduction to fixed arches.

o *Analyze the existing two hinged arch model.*

TEXT BOOKS:

1. Vazirani and Ratwani, "Analysisof Structures", Vol. 1 and 2, 13th edition, Khanna Publishers, Delhi, 2003.

2. S. Bhavikatti, "Structural Analysis" , Vol.1 and 2, 3rd edition, Vikas Publishing House Pvt. Ltd., Delhi, 2008.

REFERENCES BOOKS:

1. Devdas Menon, "Structural Analysis", Alpha Science Publications, New Delhi. 2008

2. C. S. Reddy, "Basic Structural Analysis", 2nd edition,Tata McGrawHill Publications,2009.