COURSE HANDOUT

B.E. (CE) - IV Semester

Civil-IV SEMESTER

ACADEMIC YEAR (2023-24)

Muzafar Ahmad Ganie

Assistant Professor

Civil Engineering Department

Civil Engineering Department

Model Institute of Engineering & Technology (Autonomous)

Kot Bhalwal, Jammu - 181122

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Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
CE-401	Structural Analysis-II	PCC	5	4	1	0	50	100	150

COURSE OUTCOMES

At the end of the course the student will be able to:	
CO1	Analyze continuous beams and frames to determine the bending moments and shears.
CO2	Draw Influence lines for different loading and boundary conditions of beams.
CO3	Determine fixed arches and application of Kani's method.
CO4	Understand frames for different loading and boundary conditions.
CO5	Develop flexibility & stiffness matrices for frame.

Unit-I

Analysis of continuous beams and frames (having indeterminacy up to 03 degrees) using slope deflection method and moment distribution method.

(12 Hours)

Unit-II

Influence lines: Basic concepts of influence lines, application of Muller Breslau's principle. Rolling loads- use of influence lines for determination of shear force and bending moment in simply supported beams, overhanging beams, compound beams.

(8 Hours)

Unit-III

Fixed arches: Expression for horizontal thrust and bending moment at a section, elastic center. Kani's method: analysis of continuous beams and simple frames, analysis of frames with different column lengths and end conditions of the bottom story.

(10 Hours)

Unit- lV

Approximate analysis of frames for: (i) vertical loads, (ii) lateral loads by portal method & cantilever method.

(8 Hours)

Unit-V

Matrix methods: Introduction, stiffness coefficients, flexibility coefficients, development of flexibility& stiffness matrices for plane frame, global axis and local axis, analysis of plane frame, pin jointed and rigid jointed.

(8 Hours)

Textbooks

S.No	Name of the Books	Name of the Author	Publisher Name	Edition (Pub.Yr.)
1	Theory of Structures	R.S Khurmi	S. Chand	12th (2020)
2.	Structural Analysis	R.C Hibler	Pearson	9th(2017)

Reference Books

S.No	Name of the Books	Name of the Author	Publisher Name	Edition (Pub.Yr.)
1	Strength of materials	S Timoshenko	Oxford University	3rd (2006)
2	Structural Analysis	G.S. Pandit and S. P. Gupta	Tata McGraw Hill	2ND (2008)

COURSE PLAN		
Unit-I Slope deflection method and moment distribution method.		
S.No	**Topics**	**Recommended Books**
1	Fixed End Moment and types of beams	Book 1, Ch.1
2	Analysis of different types of beams by Slope Deflection Method	Book 1, Ch.1
3	Analysis of Non-Sway Frame by Slope Deflection Method	Book 1, Ch.1
4	Analysis of sway Frame by Slope Deflection Method	Book 2, Ch.2
5	Analysis of different types of beams by Moment Distribution Method.	Book 2, Ch.2
6	Analysis of Non-Sway Frame by Moment Distribution Method	Book 2, Ch.2
7	Analysis of sway Frame by Moment Distribution Method	Book 2, Ch.2
Unit-II Influence lines		
8	Basic concepts and Graphical concepts	Book 1, Ch.3
9	ILD for Reactions of simply supported beam	Book 1, Ch.3
10	ILD for shear force at specific point of simply supported beam	Book 1, Ch.3
11	ILD for Bending moment at specific point of simply supported beam	Book 2, Ch.4
12	ILD for Reactions, Shear and Moment for overhanging beam	Book 2, Ch.4
Unit-III Fixed Arches and Kani's Method		
16	Expression for horizontal thrust and bending moment at a section, elastic center	Book 2, Ch.4
17	Analysis of continuous beams and simple frames	Book 2, Ch.4
18	Analysis of frames with different column lengths and end conditions of the bottom story.	Book 2, Ch.4
Unit-IV Matrix methods		
22	Matrix Methods	Book 2, Ch.5
23	Stiffness coefficients ,flexibility coefficients	Book 2, Ch.5
24	Development of flexibility & stiffness matrices for plane frame, global axis and local axis	Book 2, Ch.5
25	Analysis of plane frame, pin jointed and rigid jointed.	Book 2, Ch.4
Unit-V Approximate analysis of frames		
29	vertical loads	Book 2, Ch.8
30	lateral loads by portal method	Book 1, Ch.8
31	lateral loads by cantilever method	Book 2, Ch.8

ADDITIONAL WEB RESOURCES

1.	**MOOC: Learn to Solve complex Problems.** https://www.coursera.org/learn/analysing-complexity
2.	**NPTEL:** Video lectures on Structural Analysis-II Lecture series by Prof. Dr. P. Banerji, IIT Bombay https://nptel.ac.in/courses/105101086

GRADING AND ASSESSMENT

- **Sessional Test**: 20 marks
- **Assignment**: 20 marks
- **Attendance**: 10 marks
- **Final Examination**: 100 marks

COURSE POLICIES

- **Attendance**: Minimum 75% attendance is mandatory to appear in the final examination of the course.
- **Academic Integrity**: MIET's academic integrity policies apply. Plagiarism will not be tolerated.
- **Late Submissions**: Assignments and projects must be submitted by the specified timelines.

FACULTY INFORMATION

- **Office Hours**

  Monday (12:05 PM - 12:55 PM)
  Friday (12:05 PM - 12:55 PM)

- **Contact Information**
  muzafar.civ@mietjammu.in