COURSE HANDOUT

STRUCTURAL ANALYSIS-II (CE-401)

BE – 4th Semester [Branch: CE]

ACADEMIC YEAR (2024-25)

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Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
CE-401	Structural Analysis II	Core	**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

(10 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.

(10 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

(10 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.

(10 Hours)

Textbooks

S.No	Name of the Books	Name of the Author	Publisher Name	Edition (Pub.Yr.)
1	Theory of Structures	R.S Khurmi	Pearson Prentice Hall	12th (2020)
2.	Structural Analysis	G.S. Pandit and S. P. Gupta	McGraw Hill	4th (2020)

Reference Books

S.No	Name of the Books	Name of the Author	Publisher Name	Edition (Pub.Yr.)
1	Structural Analysis	R.C Hibler	CRC Press	9th (2019)
2	Theory of Structures	S. Ramamurthan	Shri Krishna Hitech Publishing	11th (2007)

COURSE PLAN		
Unit-I Slope Deflection Method & Moment Distribution Method		
S.No	**Topics**	**Recommended Books**
1	Introduction of Slope Deflection method	Book 1, Ch.17
2	Analysis of continuous beams when supports are at same level	Book 1, Ch.17
3	Analysis of continuous beams when supports are at different level	Book 1, Ch.17
4	Analysis of simple frames by slope deflection method	Book 1, Ch.17
5	Analysis of symmetrical portal frames by slope deflection method	Book 1, Ch.17
6	Analysis of asymmetrical portal frames by slope deflection method	Book 1, Ch.17
7	Analysis of continuous beams by moment distribution method when supports are at same level	Book 1, Ch.18
8	Analysis of continuous beams by moment distribution method when supports are at different level	Book 1, Ch.18
9	Analysis of simple frames by moment distribution method	Book 1, Ch.18
10	Analysis of symmetrical portal frames by moment distribution method	Book 1, Ch.18
Unit-II Influence Line And Rolling Loads		
11	Muller Breslau's principle and Rolling loads introduction	Book 1, Ch.2
12	Effect of single concentrated rolling loads and draw its influence line diagram	Book 1, Ch.2
13	Effect of UDL longer than span rolling loads and draw its influence line diagram	Book 1, Ch.2
14	Effect of UDL shorter than span rolling loads and draw its influence line diagram	Book 1, Ch.2
15	Effect of two concentrated rolling loads and draw its influence line diagram	Book 1, Ch.3
16	Effect of several concentrated rolling loads and draw its influence line diagram also find out absolute moment.	Book 1, Ch.3
17	Analysis of continuous beams	Book 1, Ch.3
18	Analysis of overhang beams	Book 1, Ch.3
19	Influence line for trusses	Book 1, Ch.4
20	Analysis of beams	Book 1, Ch.3
Unit-III Arches and Kanis Method		
21	Introduction of Kanis method	Book 2, Ch.5
22	Analysis of continuous beams when supports are at same level	Book 2, Ch.5
23	Analysis of continuous beams when supports are at different level	Book 2, Ch.5

24	Analysis of simple frames by Kanis method	Book 2, Ch.5
25	Analysis of symmetrical portal frames by Kanis method	Book 2, Ch.5
26	Analysis of asymmetrical portal frames by Kanis method	Book 1, Ch.5
27	Analysis of three hinged parabolic arches	Book 1, Ch.13
28	Analysis of three hinged circular arches	Book 1, Ch.13
29	Analysis of two hinged parabolic arches	Book 1, Ch.20
30	Analysis of two hinged circular arches	Book 1, Ch.20
Unit-IV Time value money		
31	Analysis of frames by portal method	Book 2, Ch.3
32	Analysis of frames by cantilever method	Book 2, Ch.4
33	Introduction to portal method	Book 2, Ch.4
34	Introduction to cantilever method	Book 2, Ch.3
35	Vertical Loads	Book 2, Ch.3
36	Lateral loads	Book 2, Ch.3
37	Portal frames	Book 2, Ch.3
38	Analysis of multistory frames by portal method	Book 2, Ch.3
39	Analysis of multistory frames by cantilever method	Book 2, Ch.3
40	Analysis of multistory frames subjected to lateral loads	Book 2, Ch.3
Unit-V Investment and Finance		
41	Introduction to Stiffness and Flexibility method	Book 2, Ch.8
42	Analysis of continuous beams when supports are at same level	Book 2, Ch.8
43	Analysis of continuous beams when supports are at different level	Book 2, Ch.8
44	Analysis of simple frames by Stiffness method	Book 2, Ch.8
45	Analysis of symmetrical portal frames by Stiffness method	Book 2, Ch.8
46	Analysis of asymmetrical portal frames by Stiffness method	Book 2, Ch.8
47	Analysis of continuous beams by Flexibility method when supports are at same level	Book 2, Ch.8
48	Analysis of continuous beams by Flexibility method when supports are at different level	Book 2, Ch.8
49	Analysis of simple frames by Flexibility method	Book 2, Ch.8
50	Analysis of symmetrical portal frames by Flexibility method	Book 2, Ch.8

ADDITIONAL WEB RESOURCES

1.	**NPTEL Course** – Structural Analysis II IIT Guwahati, by Prof Arbind Kumar Singh http://sdnbvc.digimat.in/nptel/courses/video/105101086/L01.html
2.	**Swayam** – https://onlinecourses.swayam2.ac.in/nou20_cs11/preview

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**
  iliyas.civ@mietjammu.in