

**Course description:**

Indeterminate structures, force method, slope deflection method, three moment equation, and moment distribution method, influence line for first-degree indeterminate beams, stiffness method for trusses, a.

Aims of the course:

To provide the students tools to understand the behavior of indeterminate structures and to be able to analyze them

Intended Learning Outcomes (ILOs):

- 1- The student will be able to explain the significance of current research about a particular topic.
- 2- The student will be able to use the force method for the analysis of statically indeterminate beams, frames, trusses.
- 3- The student will be able to analyze continuous indeterminate beams using three moment equation.
- 4- The student will be able to use the slope deflection equations for the analysis of statically indeterminate beams and frames.
- 5- The student will be able to analyze continuous beams and frames using the moment distribution method.
- 6- The student will be able to analyze indeterminate trusses using Stiffness Method

Course structures:

Week	C. Hrs	ILOs	Topics	Teaching Procedure	Assessment methods
1	3	1	Introduction to indeterminate structures	Lectures and tutorial	H.W
2	3	2	Deflection calculations	Lectures and tutorial	H.W
3		2	Force method beams	Lectures and tutorial	H.W
4		2	Force method frames	Lectures and tutorial	H.W
5		2	Force method trusses	Lectures and tutorial	H.W
6		3	Three moment equations	Lectures and tutorial	H.W
7		3	Three moment equation + 1 st exam	Lectures and tutorial	H.W
8		4	Slope deflection method beams	Lectures and tutorial	H.W
9		4	Slope deflection method	Lectures and tutorial	H.W

			frames		
10		4	Slope deflection method frames + 2 nd exam	Lectures and tutorial	H.W
11		5	Moment distribution	Lectures and tutorial	H.W
12		5	Moment distribution	Lectures and tutorial	H.W
13		6	Stiffness matrix trusses	Lectures and tutorial	H.W
14		6	Stiffness matrix trusses + final exam	Lectures and tutorial	H.W

References:

Structural Analysis R.C. Hibbeler Prentice Hall 9th edition (July 27, 2014)

Fundamentals of Structural Analysis K.M. Leet, C.-M. Uang, A.M. Gilbert McGraw Hill 4th ed., 2011

Fundamentals of Structural Analysis H.H. West and L. Geschwindner J. Wiley & Sons 2nd ed., 2002

Structural Analysis by Aslam Kassimal CL Engineering; 5 edition (January 1, 2014)

Assessment Methods:

Methods	Grade	Date
1 st exam	20	
2 nd exam	20	
Quizes + HWs	10	
Final exam	50	

