



**DEPARTMENT/INSTITUTE/DIRECTORATE: CIVIL ENGINEERING**

Name of Teacher: **Engr. Fahad Ali Shaikh**      Batch: 21CE (A+B+C)    Year: 3<sup>rd</sup>    Semester: 5<sup>th</sup>  
 Subject: **Structural Analysis**      Course Code: **CE306**  
 Semester Starting Date: **20-11-2023**      Semester Suspension Date: **29-03-2024**

**Course Learning Outcomes (CLOs):**

Upon successful completion of the course, the student will be able to:

CLO	Description	Taxonomy Level	PLO
1	SOLVE beams, frames and trusses for deflections and slopes in determinate and indeterminate structures.	C3	3
2	ANALYZE the structures by modern analytical methods	C4	2

S #	Topic	CLO	No: of lectures
1.	Introduction to the subject, classification of structures, loads, determinate and indeterminate structures, structure idealization.	1	1
2.	Determinacy and stability, degree of indeterminacy in beams, frames and trusses.	1	1
<b>DETERMINATE STRUCTURES</b>			
<b>Double Integration Method</b>			
3.	Introduction and derivation of formula.	1	1
4.	Slope and deflection of different types of beams under various loadings	1	3
<b>Moment Area Method</b>			
5.	Derivation of theorems of Moment Area Method	1	1
6.	Slope and deflection for cantilever & simply supported beams	1	2
7.	Slope and deflection for overhanging beams	1	1
8.	Slope and deflection for frames	1	2
<b>Conjugate Beam Method</b>			
9.	Introduction to conjugate beam method and conjugate supports.	1	1
10.	Problems on different types of beams at various loadings	1	2
<b>Unit Load Method</b>			
11.	Introduction and derivation of formula	1	1
15.	Slope and deflection of simple beams with different loadings	1	2
16.	Method of virtual work: Frames	1	2
17.	Method of virtual work: Trusses	1	1
18.	Theory of Castigliano	1	1
<b>INDETERMINATE STRUCTURES</b>			
<b>Three Moment Equation</b>			
17.	Introduction and derivation of formula	1	1
18.	Problems of continuous beams	1	2
19.	Shear force and bending moment diagrams of continuous beams	1	2
<b>Moment Distribution Method</b>			
20.	Introduction to the Moment Distribution Method	1	1
21.	Problems of continuous beams	1	2
22.	Problems of frames	1	2
<b>Slope Deflection Method</b>			
23.	Introduction and derivation	1	1
24.	Problems on continuous beams	1	2
25.	Problems on Frames	1	2

S #	Topic	CLO	No: of lectures
<b>Consistent deformation method</b>			
26.	Consistent deformation method: statically indeterminate Beams	1	2
27.	Consistent deformation method: statically indeterminate Frames	1	1
<b>Matrix Stiffness Method</b>			
26.	Introduction to matrix stiffness method	2	1
27.	Formation of element stiffness matrix for truss, beam and frame element	2	2
28.	Deformation and Force transformation matrix	2	2
29.	Structures stiffness matrix for truss, beam and frame elements,	2	3
<b>TOTAL</b>			<b>48</b>

Signature of Teacher:



Dated: 13/12/2023

Remarks of DMRC: **APPROVED**

Signature of Chairman:



Dated: 21/12/2023