MEHRAN UNIVERSITY OF ENGINEERING AND TECHNOLOGY JAMSHORO
Department of Civil Engineering

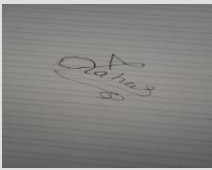**LESSON PLAN**

COURSE TITLE: **Structural Analysis**		COURSE CODE: **CE306**	CREDIT HOURS: **03**	MINIMUM CONTACT HOURS: **48**
COURSE INSTRUCTER: **Dr. Zaheer Ahmed Almani (D) / Engr. Fahad Shaikh (A+B+C)**				
Batch **21CE**	Semester: **5ᵗʰ**	Semester Starting Date: **20-11-2023**		Semester Suspension Date: **29-03-2024**

COURSE LEARNING OUTCOMES:

CLO No.	Description	Taxonomy level	Associated 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

LESSON CONTENTS AND ASSOCIATED CLO(s)

Contents	CLO No.	Marks Assigned	Delivery Methods	Assessment Methods (Marks)
Introduction -Determinate and indeterminate structures -Degree of indeterminacy in beams, frames and trusses **Determinate Structures** -Beams: Double integration, Moment area, Conjugate beam Unit load method and theory of Castiglione. - Frames: Unit load, Moment area method and movement of joints -Trusses: Unit load, Joint displacement, Graphical and angle weight method. **No. of Lectures: 22**	1	41	• Class Lecture • Discussion	• Mid semester Exam (20) • Final Exam (12) • Class Test-1 (05) • Assignment-1 (04)

Topic				Teaching Methods	Assessment
Indeterminate structures -Consistent deformation method: statically indeterminate beams /frames of one and two redundant. -Laws of reciprocal deflections -Theorem of least work -Three Moment Theorem: Derivation of the theorem and application to statically indeterminate beams -Method of Slope Deflection: Derivation of equation, Analysis of continuous beams and portal frames without joint movement/with joint movement -Analysis of continuous beams and portal frames due to yielding of supports -Moment Distribution Method Concept, distribution and carryover factors -Analysis of continuous beams and portal frames without joint movement/with joint movement. -Analysis of continuous beams and portal frames due to yielding of supports. **No. of Lectures: 18**	1	41		• Class Lecture • Discussion	• Class test-2 (05) • Final Exam (36)
Matrix Stiffness Method. -Introduction to Matrix Stiffness Method -Methods of formation of element stiffness matrix for truss, beam and frame element. -Deformation transformation matrix, Structures stiffness matrix for truss, beam and frame elements. -Analysis of indeterminate structure using stiffness method. **No. of Lectures: 08**	2	18		• Class Lecture • Discussion	• Final Exam (12) • Assignment-2 (06)

S.No.	Assessment Activities	Marks	Activities		CLO(s) to be assessed
1	Class Test/Assignment/Quiz	**20**	Assignment(s)	2	1,2
			Class test(s)	2	1
2	Mid Semester Exam	**20**	1		1
3	Final Semester Exam	**60**	1		1,2

Prepared by: Dr Zaheer Ahmed Almani	Reviewed by: **Curriculum Review Committee**	Approved by: **Chairman, CED**
Dated: 20-11-2023	Signature: Dated: 12-12-2023	Signature: Dated: 12-12-2023