MERI College of Engineering & Technology (MERI-CET)

Name of the Faculty	:	Er. Amit Kaushik	
Discipline	:	Civil Engineering	
Semester	:	4TH	
Subject (PEC-CEEL-310-G)	:	Prestress	
Lesson Plan Duration	:	15 Weeks (From MAY-AUG 2021)	
Work load (Lectures/Practical)			
Per week (in hours)	:	Lectures-02	

WEEK	LECTURE	TOPIC COVERED
01st	1st	Introduction of Prestressing system- history Types, source, advantages and its limitations
	2nd	Prestressing Systems and Devices
02nd	1st	Materials properties- Constituents of Concrete and their Properties
	2nd	Stress-Strain Curves for Concrete, Constituents of Prestressing Steel and their Properties
03rd	1st	Types of Prestressing Steel, Stress-Strain Curves for Prestressing Steel, Relaxation of Steel, Fatigue, Codal Provisions.
	2nd	ASSIGNMENT 1
04th	1st	Elastic Shortening, Pre-Tensioned & Post-Tensioned - Axial & Bending Members, Losses in Prestress - Friction, Anchorage Slip, Creep of Concrete, Shrinkage of Concrete, Relaxation of Steel, Total Time-Dependent Loss, Force Variation Diagram
	2nd	
05th	1st	
	2nd	
06th	1st	ASSIGNMENT - 2
	2nd	Analysis for Shear- Introduction, Types of Cracks,
07th	1st	Components of Shear Resistance, Modes of Failure, Effect of Prestressing Force, Stress in an Uncracked Beam, Design and Detailing Requirement for Shear, Design of Transverse Reinforcement.
	2nd	
08th	1st	Analysis for Torsion-Introduction, Crack Pattern Under Pure Torsion, Components of Resistance for Pure Torsion,

	2nd	Modes of Failure, Effect of Prestressing Force for Torsion, Stresses in an Uncracked Beam, Design and Detailing Requirement for Torsion,
9th	1st	Design of Longitudinal Reinforcement and Transverse Reinforcement.
	2nd	Assignment -3
10th	1st	Factors Influencing Deflections, Short Term Deflections of Uncracked Members
	2nd	Prediction of Long Term Deflections due to Creep and Shrinkage, Check for Serviceability Limit State of Deflection. Deflection due to Gravity Loads and Prestressing Force, Total Deflection, Determination of Moment of Inertia, Calculation of Crack Width, Method of Calculation, Limits of Crack Width.
11th	1st	
	2nd	Analysis of Members under Axial and Flexural Load-Based on Stress, Force and Load Balancing Concept. Cracking Moment, Kern Point, Pressure Line, Analysis for Ultimate Strength, Variation of Stress in Steel Condition at Ultimate Limit State, Analysis of Rectangular Sections, Flanged Sections, Partially Pre-Stressed Sections, Un-Bonded Post-Tensioned Beams.
12th	1st	
	2nd	
13th	1st	Design of Members for Axial Tension, Flexure Type I and Type II, Choice of Sections, Determination of Limiting Zone, Post-Tensioning in Stages, Magnel's Graphical Method, Guyon's Method
	2nd	/ASSIGNMENT - 4

14th	**1st**		Analysis and Design of Composite Beams – Methods of Achieving Continuity in Continuous Beams, Analysis for Secondary Moments, Concordant Cable and Linear Transformation, Calculation of Stresses, Principles of Design.
	2nd		
15th	**1st**		Design of Tension and Compression Members, Tanks, Pipes and Poles, Partial prestressing – definition, methods of achieving partial prestressing, merits and demerits of partial prestressing.
	2nd		