

CE 329: Pre stressed Concrete and Industrial Structures (3-1-0: 4)

Course objectives: To learn the principles, materials, methods and systems of prestressing: To know the different types of losses and deflection of prestressed members: To learn the design of prestressed concrete beams for flexural, shear and tension and to calculate ultimate flexural strength of beam: To learn the design of anchorage zones, composite beams, analysis and design of continuous beam; To learn the design of industrial structures.

Principles of prestressing

Materials of prestressing, Systems of prestressing, Loss of prestress, Deflection of prestressed concrete members.

Pre-tensioned and Post-tensioned beams

Design of prestressed concrete sections for flexure, shear, bond and anchorage forces minimum weight design.

Analysis and design

Analysis and design of indeterminate prestressed structures, Choice of cable profiles, Concordancy and linear transformation of cable profile, effect of creep and shrinkage on prestressed concrete structures, Design of end block, Partial prestressing, Definition- principles and design approach, Composite structures

Analysis of industrial structures

Wind load analysis on Industrial building, Braced and Unbraced Industrial building.

Text Books:

1. Nawy E.G, "Prestressed Concrete: A fundamental approach", Prentice Hall
2. Mallick S.K. and Gupta A.P, "Prestressed Concrete", Oxford & IBH

References:

1. Lin, T.Y. "Design of Prestressed Concrete Structures", John Wiley, & Sons.
2. Charles G.S. and Johnson J.E., "Steel Structures-Design and Behaviour", Addison –Wesley, Pub Co.
3. Chen W.F and Toma S. "Advanced analysis of steel frames", CRC Press.

Expected outcomes: On completion of the course, the students will be able to: design a prestressed concrete beam accounting for losses; design the anchorage zone for post tensioned members ;design composite members ;design continuous beams; design industrial structures subjected to different loading conditions.
