ST5009 PRESTRESSED CONCRETE

DETAILED SYLLABUS

UNIT I PRINCIPLES OF PRESTRESSING

Basic concepts of Prestressing - Types and systems of prestressing - Need for High Strength materials, Analysis methods, losses of prestress – Short and Long term deflections – Cable layouts.

UNIT II DESIGN OF FLEXURAL MEMBERS

Behaviour of flexural members, determination of ultimate flexural strength – Various Codal provisions - Design of flexural members, Design for shear, bond and torsion. Transfer of prestress – Box girders.

UNIT III DESIGN OF CONTINUOUS AND CANTILEVER BEAMS

Analysis and design of continuous beams - Methods of achieving continuity - concept of linear transformations, concordant cable profile and gap cables – Analysis and design of cantilever beams.

UNIT IV DESIGN OF TENSION AND COMPRESSION MEMBERS

Design of tension members - application in the design of prestressed pipes and prestressed concrete cylindrical water tanks - Design of compression members with and without flexure – its application in the design piles, flag masts and similar structures.

UNIT V DESIGN OF COMPOSITE MEMBERS

Composite beams - analysis and design, ultimate strength - their applications. Partial prestressing - its advantages and applications.

REFERENCES:

1. Arthur H. Nilson, “Design of Prestressed Concrete”, John Wiley and Sons Inc, New York, 2004.

2. Krishna Raju, “Prestressed Concrete”, Tata McGraw Hill Publishing Co., New Delhi, 2008.

3. Lin.T.Y.,and Burns.H “Design of Prestressed Concrete Structures”, John Wiley and Sons Inc, New York, 2009.

4. Rajagopalan.N, “Prestressed Concrete”, Narosa Publications, New Delhi, 2008.

5. Sinha.N.C.and.Roy.S.K, “Fundamentals of Prestressed Concrete”, S.Chand and Co., 1998.

OBJECTIVE:

Principle of prestressing, analysis and design of prestressed concrete structures.