

CE/BOS/CE E34/0210

**K L UNIVERSITY**  
**PRESTRESSED CONCRETE (09 – CE E34)**

L	T	P	Cr
3	0	0	3

**SYLLABUS**

**UNIT – 1 Introduction**

Basic concepts of prestressing; Need for High strength steel and High strength concrete; Terminology; Advantages of prestressed concrete.

**MATERIALS FOR PRESTRESSED CONCRETE:** High strength concrete; High tensile steel.

**UNIT – 2 Prestressing Systems**

Tensioning devices; Hoyer's long line system of pretensioning; Post tensioning systems; Thermo – electric prestressing; Chemical prestressing.

**Analysis of Prestress and Bending Stresses:** Basic assumptions; Analysis of prestress; Resultant stresses at a section; Pressure (Thrust) line and internal resisting couple; Concept of Load balancing; Stresses in tendons; Cracking moment.

**UNIT – 3 Losses of Prestress:** Nature of losses of prestress; Loss due to elastic deformation of concrete, shrinkage of concrete, creep of concrete, relaxation of stress in steel, friction and anchorage slip; Total losses allowed for in design.

**Deflections of Prestressed Concrete Members:** Importance of control of deflections; Factors influencing deflections; Short term deflections of un-cracked members; Effect of tendon profile on deflections.

**UNIT – 4 Limit State of Collapse: Flexural Strength of Prestressed Concrete Sections:**

Ultimate flexural strength of rectangular sections and T-sections using simplified IS code recommendations.

**Shear Resistance of Prestressed Concrete Members:** Shear and principal stresses; Shear- IS Code recommendations: Ultimate shear resistance of prestressed concrete members; Design of shear reinforcement.

**UNIT – 5 Torsional Resistance of Prestressed Concrete Members:** Design of reinforcements for torsion, shear and bending.

**Design of End Blocks:** Transmission of prestress in pretensioned members; Transmission length; Anchorage stress in post tensioned members; Bearing stress and bursting tensile force-stresses in end blocks-Methods. IS Code provision for the design of end block reinforcement.

**TEXT BOOKS: (supplemented with IS: 1343)**

1. Prestressed Concrete by N. Krishna Raju; Tata Mc.Graw - Hill Publishing Company Limited, New Delhi.
2. Pre-stressed Concrete- P. Dayarathnam: Oxford and IBH Publishing Co.

**REFERENCE BOOKS:**

1. Prestressed concrete by N. Rajagopalan; Narosa Publishing House.
2. 3. Design of pre-stressed concrete structures- T.Y. Lin and Ned H. Burns - John Wiley & Sons, New York.
3. Fundamental of pre-stressed concrete- N.C. Sinha & S.K. Roy