Course Number and Name

BCE063 - PRESTRESSED CONCRETE STRUCTURES

Credits and Contact Hours

3 & 45

Course Coordinator's Name

Mr.T.P.Maikandaan

Text Books and References

TEXT BOOKS:

1. Krishna Raju N. "Prestressed concrete", Tata McGraw Hill Company, New Delhi 2007

REFERENCES:

1. MallieS.K.and Gupta A.P. "Prestressed concrete", Oxford and VB publishing Co. Pvt Ltd., 1987.

Course Description

- To introduce the students to the basic concepts and principles of Prestressed concrete structures

Prerequisites	Co-requisites
Building Construction Technology	NIL

required, elective, or selected elective (as per Table 5-1)

Course Outcomes (COs)

CO1	To design prestressed concrete beam
CO2	To design prestressed composite beams
CO3	To design flexural members with partial prestressing
CO4	To design prestressed concrete tanks, poles and sleepers
CO5	To design prestressed concrete bridges

Student Outcomes (SOs) from Criterion 3 covered by this Course

COs/SOs	a	b	c	d	e	f	g	h	i	j	k
CO1			H	H							
CO2			H	H							
CO3			H	H							
CO4			H	H							
CO5			H	H							

List of Topics Covered

UNIT I INTRODUCTION – THEORY AND BEHAVIOUR 8

Basic concepts – Advantages – Materials required – Systems and methods of prestressing. Analysis of sections. Stress concept, Strength concept, Load balancing concept -. Effect of loading on the tensile stresses in tendons - Effect of tendon profile on deflections – Factors influencing deflections – Calculation

of deflections – Short term and long term deflections – Losses of prestress – Estimation of crack width.

UNIT II DESIGN OF END BLOCK ` 10

Flexural strength – Simplified procedures as per codes – strain compatibility method – Basic concepts in selection of cross section for bending – stress distribution in end block- Design of anchorage zone reinforcement – Limit state design criteria – Partial prestressing- Applications.

UNIT III CIRCULAR PRESTRESSING 9

Design of prestressed concrete tanks – Poles and sleepers

UNIT IV COMPOSITE CONSTRUCTION 8

Analysis for stresses – Estimate for deflections – Flexural and shear strength of composite members.

UNIT V PRESTRESSED CONCRETE BRIDGES 10

General aspects pretensioned prestressed bridge decks - Post tensioned prestressed bridge decks - Advantages over R.C.bridges - Principles of design only.