Course Number and Name
BCE082 - ENVIRONMENTAL ENGINEERING STRUCTURES
Credits and Contact Hours
3 & 45
Course Coordinator's Name
Ms. K.ANITHA
Text Books and References

TEXT BOOKS:

- Reinforced Concrete by P .Dayaratnam.
- Prestressed Concrete by Krishna Raju, Tata McGraw-ill Publishing Co. 2nd Edition 1988.
- Reinforced Concrete by N.C.Sinha & S.K.Roy - S.Chand and Co. 1985.

REFERENCES:

- Hulse R., and Mosley, W.H., "Reinforced Concrete Design by Computer", Macmillan Education Ltd., 1986.
- Ramaswamy, G.S., "Design and Construction of Concrete shell roofs", CBS Publishers, India, 1986.
- Green, J.K. and Perkins, P.H., "Concrete liquid retaining structures", Applied Science Publishers, 1981.

Course Description
• To educate the students in detailed concepts related to water transmission mains, water distribution system, sewer networks and storm water drain, with emphasis on computer application

Prerequisites	Co-requisites
Environmental Engineering	NIL
required, elective, or selected elective (as per Table 5-1)	

Course Outcomes (COs)	
CO1	To make them understand the fundamentals of Structural design of Concrete, Prestressed Concrete, Steel and Cast iron etc
CO2	To understand about the methods of analysis and design of water tanks and the types of cement roofing system
CO3	To understand in detail about the design of special purpose structures like underground reservoirs and swimming pools.
CO4	To improve the knowledge on the repair and rehabilitation of structures and also diagonising and identification of the cause and damage
CO5	To know about the exposure on steel, lattice structures used in water and sewerage

	works.

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										
CO2	H			M						L	
CO3	H	L									
CO4						H			L		
CO5		M		H							

List of Topics Covered

UNIT I DESIGN OF PIPES 9

Structural design of a) Concrete b) Prestressed Concrete c) Steel and d) Castiron piping mains, sewerage tanks design - anchorage for pipes - massive outfalls - structural design and laying - hydrodynamic considerations. Advances in the manufacture of pipes.

UNIT II ANALYSIS AND DESIGN OF WATER TANKS 9

Design of concrete roofing systems a) Cylindrical b) Spherical and c) Conical shapes using membrane theory and design of various types of folded plates for roofing with concrete. IS Codes for the design of water retaining structures. Design of circular, rectangular, spherical and Intze type of tanks using concrete. Design of prestressed concrete cylindrical tanks - Economic analysis - introduction to computer aided design and packages.

UNIT III DESIGN OF SPECIAL PURPOSE STRUCTURES 9

Underground reservoirs and swimming pools, Intake towers, Structural design including foundation of water retaining structures such as settling tanks, clarifloculators, aeration tanks etc. - effect of earth pressure and uplift considerations - selection of materials of construction.

UNIT IV REPAIR AND REHABILITATION OF STRUCTURES 9

Diagonising the cause and damage, identification of different types of structural and nonstructural cracks - repair and rehabilitation methods for Masonry, Concrete and Steel Structures.

UNIT V EXPOSURE ON STEEL, LATTICE STRUCTURES USED IN WATER AND SEWERAGE WORKS 9