

AMEV-25 DESIGN OF ENVIRONMENTAL ENGINEERING STRUCTURES

OBJECTIVES:

- To educate the structural design principles
- To educate the students on aspects of water retaining structures design
- Educating the design of masonry and steel structures used in environmental engineering

UNIT I INTRODUCTION AND DESIGN OF PIPES

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Environmental Engineering structures - Introduction -Concept of elastic method, ultimate load method and limit state method – Advantages of Limit State method over other methods – Limit State philosophy as detailed in current IS Code. Structural design of - Concrete, Prestressed Concrete, Steel and Cast-iron piping mains, - anchorage for pipes - massive outfalls

UNIT II DESIGN OF WATER RETAINING STRUCTURES

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IS Codes for the design of water retaining structures - Design of concrete roofing systems – Design of circular, rectangular tanks and Spherical tanks - Design of prestressed concrete cylindrical tank, Clariflocculators, Filters

UNIT III DESIGN OF WASTEWATER RETAINING STRUCTURES

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Structural design of wastewater treatment units - Grit chamber, Parshall flume, Aeration tank, Anaerobic baffle reactor, Sludge digester, UASBR, Sludge thickener, Sludge drying beds.

UNIT IV STORAGE STRUCTURES

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Design of Square bunker and Storage structures – IS codal provisions – Design of cylindrical silo.
Design of various types of foundation like isolated, combined and raft foundation for a Water tanks, Bunkers and Silo"s.

UNIT V SPECIAL STRUCTURES

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Design of masonry walls, pillars and footings as per NBC and IS Codes -Structural design of underground reservoirs and swimming pools, Intake towers - effect of earth pressure and uplift considerations – design of - Cyclone separator – Scrubber

TEXT BOOKS:

Krishna Raju, "Prestressed Concrete" Tata McGraw Hill Publishing Co. 2nd Edition, 1-88.

Sinha N.C. & Roy S.K "Reinforced Concrete" S.Chand and Co., 1-85
Ramaswamy, G.S., "Design and Construction of Concrete shell roofs", CBS Publishers, India, 1-86.

REFERENCES:

Green, J.K. and Perkins, P.H., "Concrete liquid retaining structures",
Applied Science
Publishers, 1-81.
Rajagopalan K., "Storage structures", Tata McGraw Hill, New Delhi, 1-8-
Krishna Raju N., "Advanced Reinforced Concrete Design", CBS Publishers and
Distributors, New Delhi, 1-88