Sl. No.	Sub. Code	Theory	Contact Hours			Credit
			L	T	P/S	
4.	22AS343	Water Supply and Sanitation	3	0	0	3

Course Objective

To acquaint students with the principles of water supply and drainage, standards and codes, and design considerations for plumbing systems in buildings.

Anticipated Learning Outcomes:

Ability to estimate water demand and draw plumbing layouts, drainage and sewage networks for simple residential buildings

Module 1
Water supply

General idea of sources of water supply: qualitative and quantitative aspects, Water requirements for different types of buildings, water saving practices Water treatment and distribution systems- Domestic water supply systems, sump, overhead storage tank, pipe size, pipe fittings.

Special installation Cold water and Hot water supply in multi-storeyed buildings. Material, types of fixtures and fitting for a contemporary bathroom– taps –quarter turn, half turn, ceramic, foam flow etc, hot water mixer, hand shower, types of valves etc. provision for firefighting and code requirements.

Rainwater harvesting to include roof top harvesting, type of spouts, sizes of rainwater pipes and typical detail of a water harvesting pit

Site visits - Water treatment plant. Multi-storeyed apartments for studying water supply and submission of reports.

Module 2
Sanitation

Principles of drainage, surface drainage, shape and sizes of drains and sewers, storm water overflow chambers, methods of laying and construction of drains and sewers

Traps: shapes, sizes, types, materials and function, Inspection chambers - sizes and construction, intercepting chamber, cast iron manholes

	Ventilation of House drainage: Anti siphon pipe, system of plumbing - single stack, one pipe system, one pipe partially ventilating system and two pipe system, grey water recycling and dual plumbing Types of fixtures and materials: Sinks, shower tray, shower temple, bath tub, Jacuzzi, water closets, flushing cisterns, urinals, sinks, wash basins, bidet, low flow fixtures, etc.
Module 3 Sanitation	Design of Septic tank, Oxidation Pond, Dispersion trench and soak pits. Treatment system- Root zone treatment system, Decentralized Wastewater. Treatment Systems (DEWATS), Soil Bio technology, packaged Bio-Reactor System.
Module 4 Solid waste disposal	Approaches for solid waste management, Solid wastes collection and removal from buildings. On-site processing and disposal methods, guidelines for municipal solid waste management, e-waste management. Disposal of Wastes: Sanitary land filling, Composting, Vermicompost, Incineration, Pyrolysis.
Module 5	Application of above studies in building projects, preparation of layouts and details. *Site visits - Sewage treatment plant.*

Note: Most Architectural subjects do not have Textbooks. The Reference books mentioned below are for reference only and University question paper should be prepared from the Syllabus descriptions.

References

1. *Birdie, B. S. (1996). Water supply and Sanitary Engineering. Dhanpat Rai and Sons.*
2. *National Building Code of India. (2005).*
3. *Punmia, B. C., Jain, A. K. and Jain, A. K. (1995). Water Supply Engineering. New Delhi: Laxmi Publications.*
4. *Rangwala, S. C. (2005). Water Supply and Sanitary Engineering. Charoter Publishing.*
5. *Handbook on Water Supply and drainage with Special Emphasis on Plumbing. Bureau of Indian Standards, New Delhi.*