

## **WASTE WATER ENGINEERING**

Module I: Waste waters-Sources, nature and characteristics, Estimation of quantities of waste water flow rate and fluctuations, quantities of storm water, Combined and separate sewerage systems, their relative merits, Design of combined and separate systems.

Module II: Sewer materials, Sewer appurtenances, Construction and maintenance of sewers and pumping of sewage, Analysis of waste water-determination of BOD, COD, Solids and volatile solids and their significance, BOD progression and its formulations.

Module III: Design of waste water treatment systems-Primary, secondary and tertiary treatments, screens, grit chambers, sedimentation tanks, chemical precipitation, Biological treatment-objectives.

Module IV: Methods and design of activated sludge and trickling filter units, Sewage sludge-its treatment, disposal and reuse, Effluent standards and its disposal.

Books for reference:

1. Sewage Disposal and Air Pollution Engineering, S.K. Garg, Khana Publishers.
2. Wastewater Engineering, B.C. Punmia, Laxmi Publications.
3. Wastewater, Treatment, Disposal and Reuse, Mtcalf & Eddy
4. Water and Wastewater Technology, Hammer & Hammer, PHL