

**Syllabus:**

Introduction, Population Forecasting and Water Demand, water supply and distribution, Physical, Chemical and Biological Characteristics of Water and Wastewater, Wastewater Flow, Sewerage system and sewer design, Basic Microbiology: cells, classification and characteristics of living organisms. Metabolic Processes, Microorganisms in Natural Water Systems, Biological Oxidation of Organic Matter. Introduction to Environmental Chemistry, Stoichiometry and Kinetics of Chemical Reactions, Equilibrium Constant and Solubility Products, pH and Alkalinity. Development of Oxygen Sag Model. Flow sheets for Water and Wastewater Treatment, Introduction to Solid Waste, Air Pollution and Noise Pollution.

Particle Fluid Mechanics as applied to the settling of Type I and II suspensions. Design and operation of Sedimentation Tanks. Coagulation and Flocculation. Hydraulics of Filtration, Design and Operation of Filter Units. Disinfection Methods. Ion exchange and Adsorption. Water Softening, Manganese and Iron Removal. Wastewater Treatment – Preliminary, Primary and Secondary Treatment Units. Aerobic and Anaerobic Processes. Purpose, theory and design of aeration units. Sludge treatment and disposal, Wastewater stabilization ponds, Aerated ponds and Oxidation ditches.

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