MANGALORE UNIVERSITY

Department of Biosciences

MSc Environmental Science

ESH451 WATER AND WASTEWATER MANAGEMENT

Course Outcomes:

CO1 Describe water pollution parameters.
CO2 Learn various methods wastewater treatment.
CO3 Realize the importance of water and water crisis.
CO4 Understand the water purification methods.
CO5 Get the knowledge of ground water quality.
CO6 Understand pollution scenario of Indian rivers.

UNIT I (13 hours)

Hydrology: Sources of water and its characteristics, Distribution of water on Earth. Physical and Chemical properties of Water, Various types of water demands - per capita demand, water quality standards for various uses. Water Pollution parameters, sources and types of Pollution, pollution scenario of Indian Rivers, water harvesting and watershed management.

UNIT II (13 hours)

Ground water Hydrology: Occurrence of groundwater, Ground water zones and Groundwater System. Porosity, permeability and types of Aquifers. Water Table, ground water flow, functions and Topography, Ground water depletion, Ground water Quality, Ground water pollution, Saltwater Intrusion, Changes in Ground water Quality.

UNIT III (13 hours)

Water purification: Screening – Treatment system- sedimentation, coagulation, filtration – rapid sand filter, slow sand filter, advantages and disadvantages. Disinfections – Methods of disinfections, water softening process. Taste and odor removal (Aeration).

UNIT IV (13 hours)

Wastewater treatment: Characteristics of wastewater, Screening & Grit chambers, primary treatment – sedimentation and flocculation, equalization, neutralization, secondary treatment – Aerated lagoons, Trickling Filters, Activated Sludge process, Oxidation pond, Aerobic and Anaerobic decomposition of wastewater, tertiary treatment, sludge drying beds.

References:

1. American Public Health Association (5th Ed). Standard Methods for Examination of Water and Waste Water (1980).
2. Fair, G.M., Geyer, T.C. and Okun, D.A. Water and waste water Engineering, Vol. I and II, John Wiley and Sons, Strauss (1984)
3. Metcalf and Eddy. Waste Water Engineering, Tata Mc Graw Hill.