

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E Semester: 4

Environmental Engineering

Subject Code

Subject Name Water Pollution & Control – I (Institute Elective-I)

Sr.No	Course content
1.	Water Pollution:- Definition: pure water, wholesome water, potable water, polluted water, effluent, Water quality: sources and impacts of impurities, classification of water quality parameter Standards: drinking water quality standards, effluent disposal standards, Surface water, pollution: sources, Effects of Surface water pollution: physico-chemical, biological, toxic and pathological, Ground water pollution: sources & effects, Consequences of overusing of surface water & ground water
2.	Water Pollution control:- Unit operations & unit processes, Primary treatment, secondary treatment, advanced and tertiary Treatment, Water treatment units: Screens: principle, classifications & design, considerations, Rapid mixers & flocculators: principle, types & design considerations, Coagulation: Colloids, Characteristics of Colloids, Coagulation Chemistry (Alum), types of coagulants, Sedimentation: principle, application, types of sedimentation tank & design considerations, Filtration: principle, working, & design considerations, Wastewater treatment units: Screens: principle, classifications & design considerations, Grit chambers: principle, classifications & design considerations, Equalization tank: principle & design considerations, Biological treatment: Aerobic treatment, Suspended growth: principle, types of treatment(conventional, activated sludge process), Attached growth: principle, types of treatment[trickling filter & Rotating Biological Contractor(RBC)], Anaerobic treatment, Basics of anaerobic treatment, Classification of anaerobic reactors, Special water & wastewater treatment: Softening: principle & application, Disinfection: principle & application, Adsorption: principle & application
3.	Thermal pollution: Sources of thermal pollution, Effects of discharge of heat, Side effects of thermal pollution, Measure of thermal pollution, Impacts of heat on living organisms, Prevention & control of thermal pollution
4.	Oil pollution: Sources & consequences, Control of oil pollution,

Reference Books:

1. Waste water Engineering by Metcalf and Eddy.
2. Environmental Engineering by Peavy and Rowe
3. Environmental Engineering by Mackenzie Davis and Cornwell.
4. Pollution Control and Environmental management by Nikhil Mukherjee.
5. Pollution Control and Management by B.D. Tiwari