CE 331 Lecture Schedule – Dr. Tanvir Ahmed

1	History of water treatment, Significance of water quality parameters: Suspended solids, turbidity, color, odour and taste, TDS, alkalinity
2.	Significance of water quality parameters: Alkalinity, hardness, fluoride, Sulphate, metals, organics, nutrients (C, N, P)
3	Significance of water quality parameters: indicator organisms - Total and Fecal coliform, water quality standards, comparison of water quality and treatment processes of different sources of water
4	**Class test-1,** Engineered systems of water purification: Gas transfer (aeration), basic principles, factors affecting effectiveness of liquid-gas contact systems
5	Solids separation: sedimentation theory and principles, clarifier design parameters, removal efficiency of discrete and flocculent settling
6	Coagulation chemistry, theory of destabilization of colloidal particles, factors affecting coagulation and flocculation
7	Softening process and chemical reactions, split treatment, softening basins, water stabilization and recarbonation
8	Filtration theory and practice, characteristics, advantages and disadvantages of Roughing filter, Slow sand and Rapid sand filter, Filter operational difficulties
9	Ion exchange practice, advantages and disadvantages, breakthrough and regeneration in the Ion Exchange process,
10	Membrane processes: Reverse Osmosis principles and applications , Electrodialysis.
11	Disinfection chemistry and kinetics, Chemical oxidant demand and break point chlorination
12	Adsorption mechanisms and applications (GAC and PAC), Manganese removal: theory and criteria
13	Arsenic and Iron removal: theory, reactions and criteria
14	**Class test - 2** and review