4CE114 Environmental Engineering – I

L-T-P-Cr: 3-1-0-4

Objective: Students should be imparted upon knowledge of Environmental Engineering using basic principles of Fluid mechanics, Biological and Chemical Science to develop basic and empirical equations for Environmental Engineering Applications. Theory:

1. Sources of Water: Ground and Surface sources 2 Lectures

2. Water Quality: Physical, chemical and biological parameters; Examination of physical, chemical and biological characteristics of water. 5 Lectures

3. Water Quantity/Demand: Design period; population forecast, variation of quantity of water demand. 3 Lectures

4. Intakes structures for surface water source. 2 Lectures

5. Water Purification: Philosophy of treatment. Unit operations and introduction to physical, chemical and biological processes. Plain sedimentation, Coagulation and flocculation, Filtration: Slow and Rapid sand filters, Disinfection, Softening, Introduction of adsorption and Reverse Osmosis and other treatment methods. 15 Lectures

6. Water Storage, pumping and Transportation of water; Water distribution systems and analysis; Appurtenances of water transport and distribution systems, hardy-cross method of analysis. 9 Lectures

7. Introduction to air and noise pollution. 6 Lectures

Reference Books/ Text Books: 1. Environmental Engineering by Peavy H.S, Rowe D.R. and Tchobanoglous G, Tata McGraw Hills, New Delhi. 2. Environmental Engineering (Vol I), Water Supply Engineering, S.K. Garg, Khanna Publishers, New Delhi. 3. G.M. Fair, J.C. Geyer, D.A. Okan, Elements of Water Supply and Wastewater Disposal, John Wiley and Sons Inc. 4. Terence, J. McGhee Water Supply and Sewerage, McGraw Hill Book Co. 5. M.J. Hammer, Water and Waste Water Technology, John Wiley and Sons, New York. 6. CPHEEO: Manual on water supply and treatment, Ministry of Urban Development.

End Semester Examination: The end semester examination will be of a predetermined duration covering the entire syllabus covering both theoretical and (or) numerical exercises upon the instructor’s discretion where all questions will need to be answered

Expected Outcome:

Students will be able to understand and develop basic and empirical equations for Environmental

Engineering Applications