

**3CE01: WATER AND WASTE WATER ENGINEERING  
CREDITS - 4 (LTP: 3,0,1)**

**Course Objective:**

1. Understand characteristics of water and wastewater and its determination
2. Study the population growth, related water demand, wastewater generation and design periods for water and wastewater treatment units
3. Expose the students to understand components of water supply lines and sewer lines.
4. Develop analytical skills and design of water and wastewater treatment units.
5. Provide fundamental knowledge about various disposal standards for sewage

**Teaching and Assessment Scheme:**

Teaching Scheme (Hours per week)			Credits	Assessment Scheme				Total Marks
L	T	P		Theory Marks		Practical Marks		
			ESE	CE	ESE	CE	150	
3	0	2	4	60	40	20		30

**Course Contents:**

Unit No.	Topics	Teaching Hours
1	<b>INTRODUCTION</b> Water Demand, Population Forecasting, Design Periods, Objectives of water and waste water treatment, Parameters commonly employed to indicate pollution strength, standards for water quality and wastewater disposal, Evaluation of assimilative capacity of water bodies	9
2	<b>WATER TREATMENT PROCESSES</b> Collection and conveyance of water, Selection of water treatment units, Treatment plant site selection, Aeration, Plain Sedimentation, Theory and Design of Mixing devises, Coagulation, Sedimentation, Filtration, Disinfection.	18
3	<b>WASTEWATER TREATMENT PROCESSES</b> Collection and conveyance of wastewater, Variation in wastewater flow, Measurement of wastewater flow, Flow diagram of wastewater treatment plant, Preliminary, Primary and Biological treatment processes: Concept and design, Treatment and disposal of sludge.	18
<b>Total</b>		<b>45</b>

**List of References:**

1. Peavy H. S., Rowe D. R. & Tchobanoglous G. “*Environmental Engineering*”, Mc Graw Hill Int., New Delhi, 1985.
2. Metcalf and Eddy, “*Wastewater Engineering Treatment, Disposal, Refuse*”, T.M.H. Edition, New Delhi, 1995.
3. Water supply Engineering-S.K.Garg , Khanna Publishers, 2015
4. Water supply engineering-B.C.Punmia, Arihant publicatoions, 2016
5. Sewage disposal and air pollution engineering. S.K.Garg,Khanna publishers,
6. Sewage disposal and engineering. B.C.Punmia.Arihant publications, 2016

7. “*Manual on Sewage and Sewerage Treatment*” 3rd Ed. Pub: CPH & Env. Engg. Organization, Ministry of Urban Development, Govt. of India, New Delhi, 1991.
8. “*Manual on Water Supply & Treatment*” 3rd Ed. Pub: CPH & Env. Engg. Organization, Ministry of Urban Development, Govt. of India, New Delhi, 1991.

**Course Outcomes (COs):**

At the end of this course students will be able to

1. Understand assessment procedure and significance of physical, chemical and biological characteristics of water and wastewater.
2. Explain the process of self-purification of the sources of disposal and determine the degree of treatment of sewage based on the source of disposal of wastewater.
3. Evaluate the quantity estimation for public water supplies and sewage generation
4. Describe and design various parameters of collection and conveyance of water and wastewater.
5. Design of water and wastewater treatment units.