

No	Course Information	
1.	Unit Name : Environmental Engineering I	
2.	Unit Code : CE-51018	
3.	Classification : Engineering Subject	
4.	Credit Hours : 3	
5.	Semester and Year Taught: 1/5	
6.	Pre-requisite (if any) : None	
7.	Mode of Delivery : Lecture , Tutorial	
8.	Assessment System and Breakdown of Marks ::	
	Practical	15%
	Practical Exam	5%
	Tutorial	10%
	Final Examination	70%
	Total	100%
9.	Academic Staff Teaching Unit :	
10.	<p>Objective of Unit:</p> <p>The objective of this course is to :- identify water demand and water quality for water supply system and apply various methods of treatment system in practical.</p>	
11.	<p>Learning Outcomes of Unit:</p> <p>On completion of this unit, students shall be able to:</p> <p>(a) Describe various methods of water quality test and treatment. (b) Design sedimentation tank, filters of water treatment system. (c) Compute losses of pipe and pumping system and water distribution system.</p>	
12.	<p>Synopsis of Unit:</p> <p>The unit is intended to describe about water quality , sedimentation tank design ,slow sand filter and rapid sand filter and water distribution system.</p>	
13.	<p>Topic 1: Water Demand and Quality</p> <ul style="list-style-type: none"> • Population forecast • Determination of population for inter- censal and post- censal years • Water Demand <p>Topic 2: Quality of Water</p> <ul style="list-style-type: none"> • Common Impurities in Water and Their Effect 	

- Quality of Source
- Water Analysis
- The Nuisance Bacteria
- Standards of Purified Water

Topic 3: Unit Operations

- Important Unit Operation
- Gas Transfer
- Ion Transfer
- Solid Transfer
- Water Treatment Processes

Topic 4: Screening and Aeration

- Coarse Screens or Bar Screens
- Types of Aerators
- Factors Governing Aeration or Gas Transfer
- Design of Gravity Aerators
- Design of Fixed Spray Aerators

Topic 5: Sedimentation

- Types of Settlings
- Settling of Discrete Particles
- Types of Sedimentation Tanks
- Maximum Velocity To Prevent Bed Uplift Or Scour
- Settling Tank Efficiency
- Details Of Plain Sedimentation Tanks
- Common Coagulants

Topic 6: Filtration

- Theory of Filtration
- Classification of Filters
- Slow Sand Filter
- Rapid Sand Filter
- Performance of Rapid Sand Filters
- Flow Through Expanded Beds

	<p>Topic 7: Disinfection</p> <ul style="list-style-type: none"> • Methods of Disinfection • Minor Methods of Disinfection • Chlorination • Forms of Application of Chlorine Factors Affecting Bactericidal Efficiency of Chlorine • Kinetics of Chemical Disinfection <p>Topic 8: Pumps and Pumping</p> <ul style="list-style-type: none"> • Types of Pumps and Their Choice • Centrifugal Pumps • Centrifugal Pump Installation • Characteristics of Centrifugal Pump • Suction Lift Limitations • Power Requirements of Pumps <p>Topic 9: Distribution of Water</p> <ul style="list-style-type: none"> • Methods of Distribution • Pressure in Distribution Mains • Systems of Water Supply • Capacity of Distribution Reservoir • Pipe Hydraulics • Pipes In Series and Parallel • Layout of Distribution System • Analysis of Pressure in Distribution System
14.	<p>Main References:</p> <p>CE 5018 Environmental Engineering I, Water Supply Engineering By Dr. B . C Punmia, Er. Ashok K. Jain, Dr. Arun K. Jain</p>