



C.U.SHAH UNIVERSITY – Wadhwan City

FACULTY OF: -Technology and Engineering (Diploma Engineering)

DEPARTMENT OF: - Civil Engineering

SEMESTER: - V **CODE:** -2TE05ENE1

NAME – Environmental Engineering

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme								
		Th	Tu	Pr	Total		Theory				Practical (Marks)				Total
							Sessional Exam		University Exam		Internal		University		
							Marks	Hours	Marks	Hours	Pr	TW	Pr	TW	
2TE05ENE1	Environmental Engineering	03	00	02	05	04	30	1.5	70	03	---	20	30	---	--

Objectives: : To provide detailed understanding regarding usage of water for drinking purpose from identification of source, planning the treatment systems, distribution of treated water with development of distribution of layout and necessity of maintenance.

Pre-requisite: Basic knowledge of Components of environment and pollution, Renewable and non renewable sources of energy, Socioeconomic measures for population, Physical, chemical and biological characteristics of domestic and industrial wastewater.

Course Outlines:-

Sr. No.	Course Contents	Teaching Hours
1	Quality of Water & Wastewater: Quality of water and wastewater, Wholesome water, Impurity of water, Characteristics of water, Examination of water, Standards of potable water quality, Characteristics of sewage, Examination of sewage, Standards of quality of treated water and wastewater	06
2	Screening and Skimming: Purpose of screenings, Flow equalization, Types of bar racks and screens, Disposal of screenings, Removal of oil, grease etc. Floatation, Skimming tank, Disposal of skimming	06
3	Sedimentation: Introduction, Principles of Sedimentation and Stokes' law applied to fluids, Characteristics of the settleable solids, Classification of sedimentation tanks for water and waste water, Factors influencing sedimentation, Deciding size of sedimentation tank for water and wastewater, Standard design loading	06
4	Filtration: Theory of filtration, Mechanism for particle size, Hydraulics of filters, Types of filters and their flow direction, Filter clogging, Filter washing, Break through, Deciding size of filter unit, Advances in filtration	06
5	Softening: Chemical precipitation, Water and wastewater softening, Estimation of dose of chemical, Methods of softening -Lime-soda method, Ion-exchange method etc	03
6	Desalination: Methods of removal of dissolved solids, Solar distillation gadgets and plants, Direct freezing, Reverse Osmosis, Electrolysis	03
7	Disinfection: Introduction, Methods of disinfection, Chlorination – Chlorine dose, Chlorine demand, Application of chlorine, Use of various forms of chlorine, Break through chlorination,	03

	Removal of colour	
8	Solid Waste Management: Definition and Sources of Solid Waste. Composition and of Solid Waste and its Determination. Impact of Solid Waste on Environment. S.W.M. Rules and Its Important. Waste Protection. Waste reduction Programme. Waste Audit.	10
9	Bio-Chemical Waste: Introduction & Definition. General & Hazardous Waste. Infectious Waste. Categorization & Composition of Bio-chemical Waste. Colour Coding. Direct & Indirect hazards	02

Term Work Incorporate appropriate field visit with concerned report, sketches and case study to enforce knowledge of Environmental Engineering.

Explanation of sketches, seminar, field visit, and case study

Learning outcomes:

Students completing the course will have:

- Ability to understanding regarding usage of water for drinking purpose from identification of source, planning the treatment systems
- Knowledge of treatment and disposal of domestic liquid wastes at individual household level to community level rural and urban.
- Ability to understanding solid waste management and pollution control.

List of experiment

1. Quality of Water & Wastewater – Demonstration of various tests related with Physical properties of water and wastewater.
2. Quantity of Water & Wastewater – Tutorials based on estimation of quantity of water and waste water.
3. Screening And Skimming Study of different types of screens, their sketches.
4. Tutorial on Sedimentation.
5. Filtration Study of various types of filters for water and wastewater.
6. Softening Study of various methods of water softening.
7. Desalination Study of process of desalination.
8. Disinfection Study of various methods of disinfections of water and wastewater.
9. Sludge Dewatering And Disposal -Tutorials based on estimation of generation of Sludge and study of method of sludge disposal.
10. Technical site visit and preparation of visit report.

Books Recommend

1. Text book of water supply and sanitary Engg - S K Hussain
2. Water supply and sanitary Engg - G S Birdi.
3. A text book of water supply - V N Gharpure
4. A text book of sanitary Engg, - V N Gharpure
5. Water supply and sanitary Engg - Vazirani and Chandola
6. Water Engineering Treatment, Disposal - WasteReuse Metcalf and Eddy
7. Water supply and Sewerage - E W Steel and Terence J McGheeed