

GUJARAT TECHNOLOGICAL UNIVERSITY

ENVIRONMENTAL ENGINEERING

B. E. SEMESTER: VII

Subject Name: **Cleaner Production and Waste Utilization**

(Department Elective –I)

Subject Code: **171304**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam (E)		Mid Sem Exam (Theory) (M)	Practical (Internal)
				Theory	Practical		
4	2	0	6	70	30	30	20

(A.) CLEANER PRODUCTION:

Sr. No.	Course Contents	Total Hrs
1.	Cleaner production concept Theory of cleaner production, Effect of CP on Industrial economy	04
2.	Cleaner Methodology Six steps methodology for CP, Designation of cleaner production team, Analyze process steps, generating cleaner production opportunities, selecting cleaner production solutions, Implementation, maintaining cleaner production	06
3.	Good House Keeping What is good Housekeeping? What is needed to implement good house keeping? Check lists for GHK	06
4.	Energy Audit Methodology Introduction preliminary or walk-through energy Audit, Detailed energy audit	06
5.	Financial Analysis Cleaner Production	04
6.	Case Studies	06

(B.) WASTE UTILIZATION:

1.	Recycling & Reuse: Concept and application	06
2.	Recycling and reuse of liquid industrial waste in different industries.	08
3.	Recycling and reuse of solid industrial waste	06
4.	Waste Heat recovery from flue gases	06
5.	Bio management for waste utilization	06

List of Term work:

1. Assignment based on concept of cleaner production
2. Assignment based on CP methodology.
3. Assignment on Energy audit of industries.
4. Assignment on Good Housekeeping concept.
5. Case studies regarding success stories in Cleaner Production.
6. Case studies on waste utilization from specific industries.
7. Assignment on waste heat recovery from flue gases.

Reference Books:

1. NCPC manual
2. Industrial Water Pollution Origins, Characterises and Treatment by Nelson Nemarow