GUJARAT TECHNOLOGICAL UNIVERSITY

CHEMICAL TECHNOLOGY (36)

INDUSTRIAL POLLUTION & CONTROL

SUBJECT CODE: 2143609

B.E. 4th SEMESTER

Type of Course: Chemical Technology (Institute Elective)

Prerequisite: A good fundamental backup of basics of different industrial pollutants and their mitigating measures.

Rationale: The main objective of this subject is to make students aware about the basics of environmental technologies as how these can be applied in Environment for reducing pollutants and also how different equipment applications are used.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
				Theory Marks			Practical Marks			
L	T	P	C	ESE (E)	PA (M)		PA (V)		PA (I)	
					PA	ALA	ESE	OEP		
3	0	2	5	70	20	10	20	10	20	150

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1	**Introduction of pollutants**: characteristics and classification of solid waste, water pollutants & air pollutants in environment.	4	15
2	**Solid Waste Management**: Bio-medical Waste, Industrial Solid Waste(Dyes & Pigment, Pharmacy, Glass & Ceramics, Rubber, Polymer, Nuclear Power Plant, Energy Industries etc.) Treatment Plant Solid Waste. Introduction and application of TSDF site, Incineration, Wet combustion, MEE	8	25
3	**Liquid Waste Management:** Industrial Waste Water (In terms of Quality & Quantities),Environmental aspect of Dyes & Pigment, Drug Industry, Glass & Ceramics, Rubber, Polymer, Nuclear Power Plant, Energy Industries etc. Special Waste Water (Toxic & Nuclear Power plant). Brief outline of Effluent Treatment Plant.	12	30
4	**Air Pollution control:** Preventive and Controlling mechanism. Introduction and application of Gravity settler, cyclone separator, Electrostatic Precipitator, Scrubber.	12	30

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks				
R Level	U Level	A Level	N Level	E Level
60	10	10	10	10

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table

Reference Books:

1. Environmental Protection by Chanlett McGraw Hill Publishing Co.
2. Wastewater Engineering Disposal & Reuse by George Tchobanoglous by Tata Metcalf & Eddy - McGraw Hill 2003edition or later.
3. Industrial Waste Treatment by Gurnham.
4. Water and Wastewater Treatment by Schroeder - McGraw Hill.
5. Management of Solid Wastes in Developing Countries by Flintoff - WHO.
6. Air Pollution by M.N. Rao McGraw Hill
7. Air Pollution by Perkins H.C. - Tokyo, McGraw Hill

Course Outcomes:

1. To know the names of pollutants present in soil, air, water and identify them.
2. Should know the applications of controlling technology in their particular field.
3. Should know the basics part so that they know how they need to apply in industries in the near future.

List of Experiments and Open Ended Projects

1.	Estimation of SVI Sludge for various Industrial Waste Water.
2.	Gravimetric Analysis : (a) Total solids (b) Suspended solid
3	Volumetric Analysis of water and Waste water (a) Acidity , Alkalinity, pH
4.	Use of sampling instruments for collection and analysis of parameters like SPM.
5.	Demonstration of Stack Monitoring Unit.

Open Ended Problems:

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.