

# GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: V

## ENVIRONMENTAL ENGINEERING

Subject Name: **Air Pollution and Control (Institute Elective-II)**

Subject Code: **151305**

Teaching Scheme				Evaluation Scheme		
Theory	Tutorial	Practical	Total	University Exam (Theory) (E)	Mid Sem Exam (Theory) (M)	Practical (I)
4	2	0	6	70	30	50

Sr. No.	Course Content
1.	<b>Introduction</b> Definition, air pollution episodes, general nature of air pollution problems
2.	<b>Air Pollutants; Sources &amp; their inventory</b> Particulate matter, carbon dioxide, carbon monoxide, sulphur oxide, effects of hydrocarbon, oxide of nitrogen, photochemical oxidants, asbestos and metals on materials and health.
3.	<b>Effects of Air Pollution</b> Effects of air pollution on human, vegetation, animals and materials.
4.	<b>Meteorology</b> Introduction, solar radiation, wind circulation, lapse rate, stability conditions, wind velocity profile maximum mixing depth, wind rose turbulence, general characteristics of plumes, heat island effect, global circulation of pollutants.
5.	<b>Mobile sources</b> IC engine and cycle, A/F ratio, sources of air pollutants, control by process change, engine design change, engines, fuel change and CNG.
6.	<b>Control of Sulfur oxide and Nitrogen oxide.</b>
7.	<b>Control of Particulates</b> Particulate control mechanisms, gravity settler, venturi scrubber, cyclone separator, bagfilters electrostatic precipitator.
8.	<b>Noise pollution:</b> sources, effects and control;
9.	<b>Odour problem:</b> causes and control.

## **Practical / Tutorial**

1. Glossary of terms related to Air Pollution.
2. Concepts & numericals in meteorology.
3. Sketches & description of control of mobile sources of Air Pollution.
4. Control techniques for NO<sub>x</sub>: sketches & description.
5. Control techniques for SO<sub>x</sub>: sketches & description.
6. Control techniques for Particulate Matter: sketches & description.
7. Sources & effects of noise pollution.
8. Questions on odour control.
9. Case study of Air Pollution episodes.
10. Stack Monitoring Kit.
11. High Volume Air Sampler.
12. Volatile Organic Carbon.
13. Weather Monitoring Station.
14. Aerosol Monitor.
15. Sound Level Meter.

## **Reference Books:**

1. Air Pollution Meteorology by Arthur C. Stern .  
(Vol. – I, 3<sup>rd</sup> Edition- Published by D. Reidel)
2. Air Pollution by Rao & Rao. (Tata McGraw-Hill Publishing Ltd.)
3. Air Pollution by Henry C. Perkins.  
(Tata McGraw-Hill Publishing Ltd.)
4. Air Pollution, its origin and control by Wark & Warner.