

CE/BOS/CE E51/0210

K L UNIVERSITY

AIR POLLUTION CONTROL ENGINEERING (09 - CE E51)

L	T	P	Cr
3	0	0	3

SYLLABUS:

UNIT – 1 Air Pollution-Sources and Effects

Definitions, Scope, Significance and Episodes, Air Pollutants – Classifications – Natural and Artificial – Primary and Secondary, Sources of air pollution- stationary and mobile sources. Effects of Air pollutants on humans, materials and vegetation. Global effects of air pollution – Green House effect, Heat Islands, Acid Rains, Ozone Holes etc.

Unit – II Meteorology and Plume Dispersion

Properties of atmosphere- Temperature, Pressure and Wind forces. Influence of Meteorological phenomena on Air Quality. Temperature lapse rates and Atmospheric Stability. Wind velocity and turbulence. Plume behaviour. Wind rose diagrams. Dispersion theories and models- stack height, plume rise.

Unit – III Air Pollution Control Methods

Source correction methods – Raw material changes, Process Changes and Equipment modifications, Particulate control equipments – Settling Chambers, Centrifugal separators, Fabric filters Wet scrubbers and Electrostatic precipitators. Collection efficiency and design problems. General Methods of Control of Gaseous emissions- Absorption, Adsorption and Combustion. Control of NO_x and SO_x emissions.

Unit – IV Air Pollution Due to Industries and Automobiles

Air pollution from major industrial operations: Mining and mineral processing, Cement manufacturing, Petroleum refinery, Metallurgical operations Thermal power plants. Air Pollution due to Automobiles: Emissions from automobiles, formation of photochemical smog, Combustion, Air-Fuel ratio, Control of Exhaust emissions.

Unit – V Air Quality Monitoring Management

Ambient Air Sampling- sampling procedures for collection of gases and particulates, High Volume Sampler. Stack monitoring- Sampling Techniques for Stack gases. Analysis of Air Pollutants: SO_x, NO_x, CO, Hydrocarbons and Particulate matter. Air quality standards and Emission standards

TEXT BOOKS:

1. Air Pollution by M.N Rao and H.V.N Rao, Tata McGraw- Hill Publishing Company Limited, New Delhi
2. An Introduction to Air Pollution by R.K Trivedy and P.K Goel,(2009) BS Publications, Hyderabad.

REFERENCE BOOKS:

1. Fundamentals of Air Pollution by Richard w. Boubel et al, Academic Press, an imprint of Elsevier, New York
2. Air Pollution control by Noel De Nevers, McGraw – Hill publishing Co. Ltd., New York.
3. Environmental Engineering by Peavy H.S, Rowe D.R. and Tchobanoglous, Tata McGraw Hills, New Delhi
4. Air Pollution and Control by KVSG Murali Krishna, Kushal &Co, Kakinada
5. Environmental Pollution Control Engineering, by C.S Rao, New Age International Publishers, New Delhi.