

GUJARAT TECHNOLOGICAL UNIVERSITY

ENVIRONMENTAL MANAGEMENT (18) APPLICATION BASED SYSTEMS FOR AIR POLLUTION CONTROL MANAGEMENT SUBJECT CODE: 2711801 SEMESTER: I

Type of course: Numerical Methods/Application based systems

Prerequisite: Air Pollution Emission Standards
Source of Air pollution and Pollutants
Air Pollution Measurement

Rationale: To develop a basic understanding about Air Pollution and pollutants

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks						Total Marks
L	T	P		Theory Marks		Practical Marks				
			ESE (E)	PA (M)	PA (V)		PA (I)			
						ESE	OEP	PA	RP	
3	2	0	4	70	30	30	0	10	10	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Air Pollution & its transport : Natural and Anthropogenic Sources, Types, Effects of air Pollutions, Indian Ambient Air Quality Standards, Wind Rose Diagram and their Applications, Meteorology and topography affecting Pollutant dispersion, Models of pollutant dispersion, Brief Introduction to the Gaussian Plume Equation: Gaussian Concentration Equation, Point Source Dispersion Formula, Dispersion Parameters in Gaussian Models, Plume Rise	12	30
2	Methods of Measurements of Air Pollutants: Sampling modes, Sampling system ,Sampling analysis for Grit and Dust, Smoke, Sulphur oxide, Carbon monoxide, Hydrocarbon, Oxides of nitrogen, Ozone and other air pollutants	4	9
3	Control equipments of Particulate Matters: Theory of control for particulate and gaseous pollutants, Types, features and operations, Selection and application.	8	19
4	Control of Gaseous Pollutants : Absorption, Adsorption, Combustion and catalytic processes.	4	9
5	Control of Specific Gaseous Pollutants Control of Sulphur Dioxide Emission, Desulphurization of Flue Gases, Dry Methods, Wet Scrubbing Methods, Control of Nitrogen Oxides, Carbon Monoxide and Dioxide and Hydrocarbons, Air Pollution Surveys	8	19
6	Vehicular Pollution and Control: Types Sources of Automobile Air Pollution, Control of Air Pollution by Automobiles Vehicle emission standards and fuel quality, Inspection and certification programme.	6	14

Reference Books:

1. Air pollution its origin and control by Wark Kenneth and Warner C.F, Harper and Row Publishers, New York, 1981.
2. Environmental pollution control Engineering by Rao C.S., New age international Ltd, New Delhi, 1995.
3. Air Pollution by Perkins H.C. - Tokyo, McGraw Hill
4. Environmental Engineering by Peavy, H.S., Rowe, D.R., Tchobanoglous, G. McGraw Hills, New York 1985.
5. Smoke Dust and Haze: Fundamentals of Aerosol Behaviour by S.K. Friedlander, Wiley 1977.
6. Air Pollution control: By De Nevers
7. Industrial Air Pollution Hand Book by Albert Parker - McGraw Hill Book Co.
8. Air pollution control: By Howard and Hesketh
9. Air Pollution Volume I to VII: By Stern
10. Air Pollution: By Seinfeld
11. Air Pollution Control Engg. by Noel de Nevers, Mc Graw Hill, New York, 1995.

Course Outcome: After completion of this course, the student is expected to be able to:

- Apply sampling techniques
- Apply modeling techniques
- Suggest suitable air pollution prevention equipments and techniques for various gaseous and particulate pollutants to Industries. Discuss the emission standards

Major Equipments:

- High Volume Air Sampler.
- Stack Monitoring Kit.
- VOC Monitor
- Flue Gas Analyzer.
- Weather Monitoring Station.
- CO Monitor.

List of Open Source Software/learning website: <http://nptel.ac.in/>