GUJARAT TECHNOLOGICAL UNIVERSITY

BRANCH NAME: ENVIONMENAL MANAGEMENT
SUBJECT NAME: AIR POLLUTION CONTROL MANAGEMENT
SUBJECT CODE: 3711801
M.E. 1st SEMESTER

Type of course: Engineering & Technology

Prerequisite: Air Pollution Standards
Sources & types of Air Pollutions & its effects
Ambient & stack Monitoring

Rationale: To develop better understanding about various methods to control Air Pollution & its applications

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE(E)	PA (M)	PA (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	**Meteorology & Air Pollution:** Various types of air pollution sources , Meteorological factors affecting air pollution , Methods for measurement of Meteorological variables , Determination of Maximum Mixing depth (MMD) , Gaussian equation for Point source of pollution & its assumptions, Plume rise theory & equations, Wind Rose diagram & applications, Various air dispersion models, National Ambient Air Quality Standard (NAAQS), Air pollution indices.	08	19
2	**Methods of Measurements of conventional Air Pollutants:** Sampling modes, Stack & Ambient air quality sampling system, Standards analytical method for Sulphur Dioxide (SO_2), Oxides of Nitrogen (NO_x) & Particulate Matter, Sampling program.	08	19
3	**Control equipment of Particulate Matters:** Selection criteria for various types of control equipments, Particulate matter removal mechanisms, Control equipment theory, principle, construction, operation & application. Operational Problems in various Particulate matter control equipments & factors effecting efficiency & modifications.	10	24
4	**Control of Gaseous Pollutants:**	08	19

	Various methods for control of Sulphur Dioxide (SO_2) & Oxides of Nitrogen (NO_x), Dry & wet scrubbing methods, Theory of control of gaseous pollutants by Adsorption, Absorption & Combustion. Sources of Volatile Organic Compounds & control methods.		
5	**Automobile Emission & Control:** Sources of automobile air pollution, A/F ratio theory & calculations, factors affecting emissions, determination Control of exhaust gas emissions by fuel change, engine design change external reactors, Vehicle emission standards & Fuel quality standards.	**08**	**19**

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 learning the course the students should 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

List of Experiments:

- Isokinetic sampling
- VOC measurement
- Ambient air quality monitoring
- Stack monitoring

List of Equipments:

- High Volume Air Sampler.
- Stack Monitoring Kit.
- VOC Monitor
- Weather Monitoring Station.