GUJARAT TECHNOLOGICAL UNIVERSITY

Environmental Engineering (17)

AIR & NOISE POLLUTION CONTROL
SUBJECT CODE: 2721710
M.E. 2nd SEMESTER

Type of course: Environmental Engineering and Technology

Prerequisite: Basics & Fundamentals of air and noise pollution

Rationale: Select appropriate technology to control the emission of pollutants

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T/P	P	C	Theory Marks		Tutorial/ Practical Marks				
				ESE (E)	PA (M)	ESE (V)		PA (I)		
						ESE	OEP	PA	RP	
3	2	2	5	70	30	20	10	10	10	150

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment; OEP-Open Ended problem; AL-Active learning;

Learning Objectives:

- To impart knowledge on the principles and design of control of indoor/ particulates/ gaseous air pollutant and its emerging trends

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	**Air Pollution:**, Sources types effects of air pollution , Units of measurement of Air Pollution, Ambient Air quality and emission standards, Air pollution indices	6	15
2	**Meteorology:** Introduction, wind circulation, lapse rates, stability conditions, wind velocity profile maximum mixing depth, wind rose diagram, turbulence, general characteristics of stack plumes.	6	15
3	**Modelling of Dispersion of Air Pollutants:** Theory on types of Dispersion models, Brief introduction to the Gaussian Plume Equation: Gaussian concentration equation, Point source dispersion formula, dispersion parameters in Gaussian models. Effective stack height and mixing depths.	6	15
4	**Sampling and Particulate Pollution Control Methods:** Atmospheric sampling and analysis for grit, dust, smoke, Sulphur dioxide, Carbon Monoxide, Hydrocarbon, Oxides of Nitrogen, Ozone Stack sampling methods, Settling chambers, Cyclone separators, Scrubbers, Filters and Electrostatic precipitators,	8	20
5	**Gaseous pollution control methods and automobile pollution:** Types of gaseous pollution control methods – absorption, adsorption and combustion processes.	8	20

	Source of Automobile pollution , vehicle emission standard and fuel quality, inspection and certificate programme IC engine and cycle, A/F ratio, control by process change, engine design change, fuel change, catalytic converters		
6	**Noise Pollution:** Physics and effects of noise, sources, monitoring, treatment of noise source, path and receptors	6	15

Reference Books:

1. Air Pollution Control Engineering by N.D. Nevers, Mc-Graw Hill Publication
2. Air Pollution by M. N. Rao Tata Mc-Graw Hill Publication
3. Air Pollution – K Wark and C Warner
4. Air Pollution control Engineering by Noel de Nevers, Mc-Graw Hill Publication, New York.
5. Fundamentals of Air Pollution by Richard W. Boubel et al., Academic Press, New York.Air Pollution by H. C. Perkins
6. Environmental Engineering by Peavy and Rowe, Mc-Graw Hill Publication
7. Environmental Engineering by Davis. Mc-Graw Hill Publication
8. Environmental Engineering Hand Book by Lee and Liptak Chiltan Book Co., Philadelphia.

Course Outcome: After successful completion of the course the students shall be able to

- evaluate the impacts of air pollution on human, vegetation and animal
- prepare plan strategies to control and reduce air pollution

Major Equipments:

1. Experiment based on Instrument of High Volume Air Sampler (PM 10) and PM2.5 for Ambient Air Quality Monitoring of Different locations.
2. Experiment based on Stack Monitoring Kit for Stack Monitoring in different Industries.
3. Experiment on Noise level Measurement of Different Areas.
4. Exercise on effects of combination of different sound
5. Report of an noisy area of a township and creation contour of loudness
6. Visit to field for noise pollution
7. Preparation report of field visit
8. Presentation of report

Design based Problems (DP)/Open Ended Problem:

- Dispersion Modeling of Air Pollutants

List of Open Source Software/learning website:

- http://elearning.vtu.ac.in/
- www.nptel.iitm.ac.in/courses/