GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Environmental Engineering

Level: Post Graduate

Branch: Environmental Management

Course/Subject Code: ME01018011

Course / Subject Name: Air Pollution

w.e.f. Academic Year:	2024-25
Semester:	1st Semester
Category of the Course:	PEC

Prerequisite:	Dispersion of Air Pollutants, Ambient & stack Monitoring, Air Pollution Standards, Noise and Odor Pollution
Rationale:	To develop better understanding about various aspects of dispersion, measurement, monitoring of air pollutants generating from different sources.

Course Outcome:

After Completion of the Course, Student will able to:

No.	Course Outcomes
01	Relate effects of meteorological condition on categorization of atmospheric stability and calculate air pollution concentration
02	Demonstrate stack and ambient air quality monitoring
03	Discuss the measures to control the emission from mobile sources.
04	Summarize sources, effects and control of noise and odor pollution
05	Discuss the air pollution sources in major polluting industries.

Teaching and Examination Scheme:

Teaching Scheme(in Hours)			Total Credits L+T+(PR/2)	Assessment Pattern and Marks				Total Marks
				Theory		Tutorial/Practical		
L	T	PR	C	ESE (E)	PA/ CA (M)	PA/CA(I)	ESE (V)	
3	0	2	4	70	30	20	30	150

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1	**Meteorology:** Meteorological factors affecting air pollution , Methods for measurement of Meteorological variables , Determination of Maximum Mixing depth (MMD) , Plume rise theory, Wind Rose diagram & applications, Gaussian Dispersion	9	19
2	**Air quality monitoring and air quality standards** **Monitoring of Gaseous Pollutants:** Sampling and analysis of gaseous pollutants from stack and ambient as per relevant IS codes **Automobile Exhaust Monitoring:** Collection of automobile pollutants, Monitoring, standards **Stack Monitoring:** Purpose, planning, specifications, Methods of Testing, sampling procedure, calculations **Units of measurement of Air Pollution.**	13	29
3	**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.	8	19

4	**Noise Pollution and odor pollution:** **Noise Pollution:** Introduction, Noise Measurement Scale – Levels and the decibels ,Instruments for noise measurement, Noise pollution monitoring, Indian Standards, Noise pollution control O**dour Pollution:** Introduction, Measurement of odor, odor control technologies	**8**	**19**
5	**Sources of Air Pollution from following industries:** (a) Cement industry (b) Chemical industry (c) Thermal Power plant (d) Foundry and induction furnace metal industries (e) Ceramic industry	**7**	**14**
	Total	**45**	**100**

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
10	**40**	**30**	**20**	**0**	**0**

Where R:Remember; U:Understanding; A:Application, N:Analyze and E:Evaluate C:Create(as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

- Air Pollution – by Wark & Warner
- Air Pollution – by M. N. Rao
- Handbook of Methods in Environmental Studies- by S.K.maiti (Volume 2)
- Air Pollution control in industries by T.K.Ray

(b) Open sources of software and website: US EPA

Suggested Course Practical List:

- Measurement of Ambient Air Quality Parameters using High Volume Air Samplers
- Measurement of Sound Pressure Levels at different locations.
- Demonstration of Stack Monitoring kit.

List of Laboratory/Learning Resources Required:

1. High volume air sampler.
2. Sound Level Meter
3. Stack monitoring kit

Suggested Activities for Students:

- Industrial visit

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