

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BRANCH NAME: Environmental Engineering (17)**

**SUBJECT NAME: Air & Noise Pollution**

**SUBJECT CODE:**

**M.E. 1<sup>st</sup> 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<br>C | Examination Marks |        |                 |        | Total<br>Marks |
|-----------------|---|---|--------------|-------------------|--------|-----------------|--------|----------------|
| L               | T | P |              | 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<br>Hrs | % Weightage |
|---------|---|--------------|-------------|
| 1       | <b>Air pollution:</b> Definition, sources and types of air pollution, effects of air pollution, measurement unit of air pollution, Ambient air quality standards, air quality indices, global and local level scenario of air pollution.  | 5            | 10          |
| 2       | <b>Meteorology:</b> Introduction, Role of meteorology in environmental engineering, types of lapse rates, stability conditions, wind velocity profile, maximum mixing depth, wind rose diagram, inversion, plume rise and plume behaviour   | 7            | 15          |
| 3       | <b>Modelling of Dispersion of Air Pollutants:</b> Wind Dispersion, Dispersion models, Gaussian Plume Equation with assumptions, Point source dispersion formula, other mathematical modelling for dispersion of air pollutants, determination of effective stack height   | 7            | 18          |
| 4       | <b>Sampling and control methods for Particulate Pollution and Gaseous pollution:</b> Atmospheric sampling and analysis for grit, dust, smoke, Sulphur dioxide, Carbon Monoxide, Hydrocarbon, Oxides of Nitrogen, Ozone, Types of Gaseous Pollution Control Methods – Absorption, Adsorption and Combustion Processes. | 9            | 24          |
| 5       | <b>Vehicular pollution:</b> Vehicular Pollution, Emission Standards for Indian Context, Influencing Parameters for Vehicular Emissions, Remedial Measures, Catalytic Converters, Exhaust Gas Recirculation, Current Practices for Controlling Emissions   | 7            | 18          |
| 6       | <b>Noise Pollution:</b> Sources and Effects of Noise Pollution, Noise Emission and Immission, Measurement of Noise, Legislative Standards, Path and Receptors of Noise, Noise Barrier   | 7            | 15          |

## Reference Books:

1. Air Pollution by M. N. Rao Tata Mc-Graw Hill Publication
2. Air Pollution control Engineering by Noel de Nevers, Mc-Graw Hill Publication, New York.
3. Environmental Engineering by Peavy and Rowe, Mc-Graw Hill Publication
4. Environmental Engineering by Davis. Mc-Graw Hill Publication
5. Environmental Engineering Hand Book by Lee and Liptak Chilton Book Co., Philadelphia.
6. Rao C.S., Environmental pollution control Engineering, New age international Ltd, New Delhi, 1995.
7. Air Pollution and Control By K.V.S.G.Murali Krishna, Kindle Edition
8. Environmental Pollution Control Engineering by C. S. Rao, New Age International Publication
9. Control of Noise Pollution by N. S. Kamboj, Deep & Deep Publications
10. Noise Measurement and Control by Lord N Thomas, HEYWOOD & Company Ltd.
11. Noise Control in Industry by E. & F. N. Spon, Sound Research Laboratories Ltd.

## Course Outcome:

After learning the course the students should be able to:

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

## List of Experiments:

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

## Major Equipment:

- Noise Meter
- High Volume Sampler (PM 10 & PM 2.5)
- Stack Monitoring Kit

## List of Open Source Software/learning website:

- <http://elearning.vtu.ac.in/>
- [www.nptel.iitm.ac.in/courses/](http://www.nptel.iitm.ac.in/courses/)