**20CE41EB – AIR AND NOISE POLLUTION CONTROL**

**(Civil Engineering)**

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| **Course Category** | Professional Elective | **Credits:** | 3 |
| **Course Type** | Theory | **Lecture - Tutorial - Practical** | 3 - 0 - 0 |
| **Prerequisite** | None | **Sessional Evaluation** | 40 |
| **Semester End Exam Evaluation** | 60 |
| **Total Marks** | 100 |

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| **Course Outcomes** | CO1 | Discuss the concepts of air pollution and assess the sources. |
| CO2 | Estimate the effects of air pollutants on human beings, materials and vegetation. |
| CO3 | Estimate the quantity of air pollution. |
| CO4 | Develop the control technologies for particulate pollutants and to Relate the fundamental concept of air quality management. |
| CO5 | Discuss the concepts of sound, noise and characteristics of noise. |
| CO6 | Measure the noise and to develop control measures of noise pollution |
| **Course**  **Content** | **UNIT I**  **AIR POLLUTION:** Definition of Air Pollution - Sources & Classification, Source inventory of Air Pollutants - Air Quality and Emission standards - Sampling of Pollutants in ambient air - Stack sampling.  **UNIT II**  **EFFECTS OF AIR POLLUTANTS:** Effects of air pollution on human beings, materials, vegetation, animals – global warming – ozone layer depletion – Sampling and Analysis – Basic Principles of Sampling – Source and ambient sampling – Analysis of pollutants – Principles.  **UNIT III**  **METEOROLOGY AND AIR POLLUTION:**Elements of atmosphere- Factors influencing air pollution, Wind rose, Mixing Depths, Lapse rates and dispersion - Atmospheric stability, Plume rise and dispersion.  **UNIT IV**  **CONTROL OF PARTICULATE POLLUTANTS:** Particle size distribution - Control mechanism - Dust removal equipment –working principle and operation of settling chambers, cyclones, wet dust scrubbers, fabric filters and Electro Static Precipitator.  **AIR QUALITY MANAGEMENT:** Air quality standards – Air quality monitoring – Preventive measures – Zoning – Town planning regulation of new industries – Legislation and enforcement.  **UNIT V**  **NOISE POLLUTION:** Basics of acoustics and specification of sound; sound power, sound intensityand sound pressure levels; Sources of Noise, typical range of noiselevels, types of noise pollution, Characteristics of noise, Effects of noise on the human health, Reactions to noise, psychologicaleffects.  **UNITVI**  **MEASUREMENT OF NOISE:** Assessment and Evaluation,Frequency sensitivity and equal loudness characteristics, Vibration – Measurement - Measuring Noise at workplace and community levels.  **NOISE CONTROL AND ABATEMENT MEASURES:** Noise control at the source, Source-Path-ReceiverConcept, Control of Noise Source by Design and Redress, Noise controlin the transmission path, Acoustical Separation, Physical Barriers, Isolators and Silencers,Protecting the receiver, Equipment and Shelters | |
| **Textbooks**  **and**  **References** | **TEXT BOOKS:**   1. D. Anjaneyulu, *Air Pollution and Control Technologies*, Allied Publishers, 2nd edition, reprint in 2020. 2. M.N. Rao, and H. V. N. Rao, *Air Pollution Control*, Tata-McGraw-Hill Publication, 1st edition, 2017. 3. S.C. Bhatia, *Noise Pollution and its control,*Atlantic Publication, 2007.   **REFERENCES**   1. W. L. Heumann, *Industrial Air Pollution Control Systems*, McGraw-Hill, 1997. 2. S. P Mahajan, *Pollution Control in Process Industries*, Tata McGraw-Hill Publishing Company, 1991. 3. S.W Peavy, D.R. Rowe and G. Tchobanoglous, *Environmental Engineering*, McGraw Hill, 1985. | |

**CO-PO Mapping:** 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

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|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 1 | - | - | 1 | - | 3 | - | - | - | - | - | - | - | 1 | - |
| **CO2** | 2 | 1 | - | 1 | 1 | 3 | - | 1 | 2 | - | - | 1 | - | 2 | 1 |
| **CO3** | 3 | 3 | - | 1 | 1 | - | - | - | - | - | 1 | 1 | - | 1 | - |
| **CO4** | 2 | 2 | 3 | 3 | 3 | 1 | 2 | - | - | - | 2 | 1 | - | 2 | 1 |
| **CO5** | 1 | 1 | - | - | - | 1 | - | - | - | - | - | 1 | - | 1 | 1 |
| **CO6** | 2 | 2 | 3 | 3 | 2 | 2 | 1 | - | - | - | 1 | 2 | - | 2 | 1 |