SEMESTER S7

AIR POLLUTION CONTROL

Course Code	OEBT726	CIE Marks	40
Teaching Hours/Week (L: T:P: R)	3:0:0:0	ESE Marks	60
Credits	3	Exam Hours	2 Hrs 30 Min.
Prerequisites (if any)	Nil	Course Type	Theory

Course Objectives:

1. To understand the atmospheric pollutants, standards, regulations, emission sources, and their fate.
2. To imbibe the fundamentals of atmospheric stability and air pollutant transport, characteristics of emission sources, and their control methods.

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SYLLABUS

Module No.	Syllabus Description	Contact Hours
1	Structure and composition of Atmosphere – Definition, Scope, and Scales of Air Pollution- Sources and classification of air pollutants-Effect on human health, vegetation, animals, property, aesthetic value and visibility- Ambient Air Quality and Emission standards–Ambient and stack sampling and Analysis of Particulate and Gaseous Pollutants.	9
2	Effects of meteorology on Air Pollution - Fundamentals, Atmospheric stability- Dry adiabatic lapse rate derivation, Inversion, Wind profiles and stack plume patterns- Atmospheric Diffusion Theories–Dispersion models, Plume Rise-Numerical Problems.	9
3	Gas Particle Interaction – Working principle, Design, and performance equations of Gravity Separators, Centrifugal separators, Fabric filters, Particulate Scrubbers, Electrostatic Precipitators – Operational Considerations- Factors affecting Selection of Control Equipment	9
4	Working principle, Design, and performance- equations of absorption, Adsorption, condensation, Incineration, Bio scrubbers, Venturi scrubber-	9

	Biofilters. Sources types and control of indoor air pollutants- sick building syndrome types – HVAC system issues and impacts on occupants—Developing an IAQ profile-Diagnose IAQ problem- Control-Quantification and Measurement.	

Course Assessment Method
(CIE: 40 marks, ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE):

Attendance	Assignment/ Microproject	Internal Examination-1 (Written)	Internal Examination- 2 (Written)	Total
5	15	10	10	40

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End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Total
• 2 Questions from each module. • Total of 8 Questions, each carrying 3 marks (8x3 =24marks)	• Each question carries 9 marks. • Two questions will be given from each module, out of which 1 question should be answered. • Each question can have a maximum of 3 sub divisions. (4x9 = 36 marks)	60

Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome		Bloom's Knowledge Level (KL)
CO1	Define the sources, classifications, effects of air pollutants.	**K1**
CO2	Explain the ambient air quality standards as well as sampling and analysis of air pollutants from emission sources.	**K2**
CO3	Outline the concepts of atmospheric dispersion characteristics and nature based on lapse rate and inversion.	**K2**
CO4	Explain the selection strategies and types of equipment and its design to control particulates and gaseous pollutants	**K2**
CO5	Explain the indoor air pollution sources, measurements, standards and control methods.	**K2**

Note*: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

CO-PO Mapping Table:

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						3	3					3
CO2						3	3	3				3
CO3	2	3					3					2
CO4			3				3					2
CO5							3					3

Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Air Pollution Control Engineering,	Lawrence K. Wang, Norman C. Pareira, Yung Tse Hung,	Humana Press Inc.	Second, 2004
2	Air Pollution Control Engineering,	Noel de Nevers	Mc Graw Hill	Second, 1999
3	Air Pollution and Control Technologies,	Anjaneyulu. Y,	Allied Publishers (P) Ltd.	First, 2002
4	Environmental Pollution Control Engineering	C.S.Rao	Wiley Eastern Ltd,	Third, 2018
5	Handbook of Air Pollution Prevention and Control,	Nicholas P. Cheremisinoff	Butterworth and Heinemann, Elsevier Science (USA), 2002	2002

Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Air Pollution	David H.F. Liu, Bela G. Liptak	Lweis Publishers	First, 2000
2	Air Pollution (Vol.I – Vol.VIII)	Arthur C.Stern	Academic Press	First, 2006
3	Air Pollution Engineering Manual	Wayne T.Davis,	John Wiley & Sons, Inc.	First, 2000

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Video Links (NPTEL, SWAYAM…)	
Module No.	**Link ID**
1	https://nptel.ac.in/courses/105107213
2	https://nptel.ac.in/courses/105107213
3	https://nptel.ac.in/courses/105107213
4	https://nptel.ac.in/courses/105107213