Birla Institute of Technology & Science, Pilani
Hyderabad Campus

SECOND SEMESTER 2020-2021

Course Handout Part II

Date: 16-01-2021

In addition to part-I (General Handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

Course No. : CHE F411
Course Title : Environmental Pollution Control
Instructor-in-Charge : Prof Jaideep Chatterjee

Course Description:

This course has been designed with the view that Environmental degeneration due to anthropogenic activities, is a major cause for concern and hence is a critical area of expertise whose significance will continue to grow in the future. The first part of the course covers various aspects of air-pollution, such as dispersion of air pollutants, Indoor air-pollution and technologies to mitigate air-pollution. The second part of the course deals with water pollution, which include basic understanding of various causes and emerging issues in the area of water pollution. The course then covers many conventional and emerging technologies used to prevent water pollution. The course also covers solid waste and hazardous waste management. The topic of Noise pollution and its mitigation will also be covered.

Scope and Objective

- Understanding of air pollution from stationary and mobile sources
- Know-how of state-of-art technologies available for preventing and mitigating air-pollution.
- Understanding the importance of atmospheric dispersion in air-pollution
- Understanding of Water pollution from municipal and industrial sources
- Know-how of state-of-art and emerging technologies available for treating water.
- Know-how of solid waste management techniques
- Understanding of Noise pollution, its quantification and mitigation.

Textbook:

1. Mackenzie L Davis, David A Cornwell. Introduction to Environmental Engineering, Fourth Edition. McGraw Hill, 2010.
2. Rao, C.S., Environmental Pollution Control Engineering, New Age International 2nd Ed., 2006.

Reference books

Course Plan:

Lecture No.	Learning objectives	Topics to be covered	Chapter in the Text Book
1	Air Pollution: Sources and Effects	Types of air pollutants, Effect of air pollution, Air pollution laws and standards	TB1 Chapter 9 TB2 Chapter 2
2-3	Meteorological Aspects of Air Pollutant Dispersion	Concept of dispersion of pollutants in atmosphere, Understanding of air dispersion models	TB1 Chapter 9 TB2 Chapter 3
4-5	Indoor Air Pollution	Indoor air-purification. Air-purification wrt micro-organisms & viruses	TB1 Chapter 9
6-10	Air Pollution Control Methods & Equipment (Control of Particulate Pollutants)	Gravity Settlers, Cyclone separators, Electrostatic precipitation, Air Filtration, wet-scrubbers	TB1 Chapter 9 TB2 Chapter 5
10-16	Air Pollution Control Methods & Equipment (Control of Molecular Pollutants)	Spray towers, Packed towers, Venturi-scrubbers, Adsorption, Absorption, Incineration, Catalytic Oxidation	TB1 Chapter 9 TB2 Chapter 5
17-19	Control of Specific Gaseous Pollutants	Various control techniques for pollutants such as SO_2, NO_X, CO and hydrocarbons	TB1 Chapter 9 TB2 Chapter 6
20	Control of pollution from Mobile sources (Vehicular)	Various control techniques for addressing vehicular pollution	TB1 Chapter 9
21	Sampling and Measurement of air-pollutants	Sampling and Measurement techniques used in air-pollution	TB1 Chapter 9 TB2 Chapter 4
22-24	Introduction to Water Pollution	Introduction to water pollution, Types of water pollutants, acidification of natural waters	TB1 Chapter 7 TB2 Chapter 7
25-28	Parameters for measuring Water Pollution	Understanding of concepts of DO, BOD, COD, TOC, The DO sag curve	TB1 Chapter 7 TB2 Chapter 8
29-32	Wastewater Treatment (Primary and Secondary)	Primary and secondary (Bio-logical) treatment of waste-water	TB1 Chapter 8 TB2 Chapter 9
33-34	Advanced physical treatment methods	Conventional & Advanced physical treatment techniques for water purification	TB1 Chapter 6
35-38	Advanced Chemical treatment methods	Conventional & Advanced chemical treatment techniques for water purification	TB1 Chapter 6
39-40	Solid Waste & Hazardous Waste Management	Classification of solid waste & Various disposal methods, Classification of Hazardous waste	TB1 Chapter 11 & 12 TB2 Chapter 10 & 11
41-42	Noise Pollution, Its quantification & Mitigation	Understanding of noise pollution & its quantification , measurement and impact	TB1 Chapter 10

Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of Component
Class Test 1	50 min	10 %	Before 28/02/21	OB
Mid-Semester	90 min	30 %	01/03 3.30 - 5.00PM	OB
Class Test 2	50 min	10 %	Before 15/04/21	OB
Assignment(1)	1 week	10 %	Before 30/04/21	OB
Comprehensive Exam	2 hours	40 %	03/05 FN	OB

Chamber Consultation Hour: 5 PM – 6 PM MWFs.

Notices: All notices concerning this course will be uploaded in CMS

Make-up Policy: Only with prior permission from IC.

Academic honesty and academic integrity Policy:
Academic honesty and academic integrity are to be maintained by all of the students throughout the semester and no type of academic dishonesty is acceptable.

INSTRUCTOR-IN-CHARGE
Jaideep Chatterjee
CHE F411