**INSTRUCTION DIVISION**
**FIRST SEMESTER 2015-2016**
**Course Handout (Part II)**

**Date: 3/08/2015**

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.** : **CE F323**
**Course Title** : **Introduction to Environmental Engineering**
**Instructor-in-charge** : **ANUPAM SINGHAL**

## 1. Course Description:

In this course, the fundamental concepts involved in several aspects of origin and pollution control pertaining to Air Quality, Water Quality, Solid Waste, & Noise; global pollution problems such as Ozone depletion, Global warming, & Acid rain will be discussed. Environmental Impact Assessment (EIA) is a powerful tool used in the site selection of an industry/project, where the basic knowledge about all the aspects mentioned above is essential. The principles and applications of EIA will be addressed through several case studies.

## 2. Scope and Objective of the Course:

With rapid industrialization and diversified ranges of human activities in pursuit of their day-to-day needs, the pollution problems are on the rise and are assuming enormous significance in bringing about various environmental changes. In this course, the pollution problems with respect to water quality, air quality, solid waste, & other related aspects are addressed and the fundamentals involved in each of the above areas will be discussed. The Environmental Impact Assessment, which is a legislative tool to control pollution from waste generators will be discussed along with several case studies. The course focuses on a multi – disciplinary approach in understanding the principles in the subject for applying to real life problems.

## 3. Text Books:

**T1.** Masters Gilbert M., "Introduction to Environmental Engineering and Science", Pearson Education, Inc., 3rd ed., 2009.

## 4. Reference Books:

**R1.** Peavy, H.S., Rowe, D.R. and T. George, "Environmental Engineering", McGrawHill International Editions,2013.
**R2.** Punmia B.C, A. Jain and A. Jain. "Water Supply Engineering", Laxmi Publications, 2nd ed., Reprint, Delhi, 1999.
**R3.** Punmia B.C, A. Jain and A. Jain. "Wastewater Engineering (Including Air Pollution)", Laxmi Publications, 2nd ed., Reprint, Delhi, 1999.
**R4.** Garg, S.K. "Sewage Disposal and Air Pollution Engineering" Khanna Publishers, 22nd ed., Delhi, 2009.
**R5.** Kiely G., "Environmental Engineering", Tata McGraw Hill Editions, Delhi, 2007.

**5. Course Plan:**

| Lec. No. | Learning Objectives | Topic to be Covered | Reference |
|---|---|---|---|
| 1-2 | Introduction | Basic units of measurement, Mass and Energy Transfer. | Ch. 1.1 to 1.4 of T1. |
| 3-4 | Environmental Chemistry | Stoichiometry, Enthalpy in Chemical Systems and its application in the course | Chapter 2 of T1 |
| 5-13 | Water Pollution and its Control | Origin of surface and groundwater resources and their characteristics; Unit operation for water and wastewater treatment; Causes of pollution; Water quality management in Lakes, Reservoirs and Rivers and Groundwater; Mathematical models to predict water quality of these resources. | Ch. 5 of T1; Ch: 2,3,4 of R2. Ch, 6, 7, 11, 12 of R5. Ch. 8-11 of R2; Ch.9,10, 11-16 of R3. |
| 14-20 | Solid Waste Management | Basic definitions; Life-cycle Assessment, Source Reduction, Collection and Transfer Operations, Treatment, Recycling and Recovery and Disposal of Solid waste. | Ch. 9 of T1; Ch. 10,11,12 of R1. |
| 21-26 | Air Quality Management | Basic definitions, Meteorological aspects, Criteria Pollutants, Gaussian model, Unit operations. | Ch. 7 of T1; Ch. 8, 16 of R5. |
| 27-31 | Noise Pollution Control | Basic definitions; Sound levels from several sources; Impacts; Control strategies. | Ch. 20 of R4; Ch.9 of R5. |
| 32-37 | Environmental Impact Assessment | Basic definitions; Methodologies; Applications using case studies. | Ch. 19of R5 and Ch. 21 ,22 of R4. |
| 38-42 | Risk Assessment | Significance of Risk assessment, Perception of Risk, Risk Assessment: methodology and prediction | Ch. 4 of T1 |

**6. Evaluation Scheme:**

| EC. No. | Evaluation Component | Duration | Weightage % | Date, Time & Venue | Nature & Component |
|---|---|---|---|---|---|
| 1. | Mid Sem Test | 90 min | 35 | 6/10 2:00 - 3:30 PM | Closed Book |
| 2. | Assignment | -------- | 20 | To be announced in class. | ---------- |
| 3. | Compre Exam. | 3 hrs. | 45 | 4/12 FN | Open Book/Closed Book |

**7. Chamber Consultation Hour:** To be announced later.

**8. Notices:** Notices concerning the course will be displayed on Civil Engineering Department Notice Board.

**9. Make-up Policy:** Prior permission is essential for make-up. Make-up will be granted for genuine cases only.

**Instructor-In-Charge**
**CE F323**