



INSTRUCTION DIVISION
FIRST SEMESTER 2016-2017
Course Handout (Part II)

Date:02/08/2016

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 G513**
Course Title : **Environmental Management Systems**
Instructor-in-Charge : **SMITA RAGHUVANSHI**

1. Course Description

Study of environmental policies, environmental laws, and environmental regulations and permit procedures; ISO series; life cycle analysis; environmental audit; environmental impact assessment, environmental economics, climate change, risk assessment, hazardous waste management, integrating environmental and safety management; case studies.

2. Scope and Objective

This course aims at making students learn about environmental policies, environmental laws; national and international regulations (CPCB and US EPA) and various permit procedures. It incorporates the learning of environmental management standards in the form of ISO 14000. The next part deals with the environmental auditing (EA), life cycle assessment (LCA), environmental impact assessment (EIA) and risk assessment (RA). Both LCA and EIA are significant in terms of impact calculations and its assessment. One software, Umberto Nxt is added which teaches LCA based calculations. This portion includes impact calculations is more mathematical in nature. Even the environment is understood, that how much saving one kg of pollutant would save in terms of money. Hence case studies on environmental policies linking with economics are added.

These concepts are taught with the inclusion of different case studies from the industries. The course also introduces a case study formulation from given data & the problem solving approach on different topics. The handout would incorporate case studies of both national and international nature.

3. Text Book (TB)

TB: Manjare S.D. and Babu B.V., "Environmental Management Systems ", BITS, EDD Notes, 2005.

4. Reference Books (RB)



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- R1 Steven L. Erickson, Brian J. King, "Fundamentals of Environmental Management", John Wiley & Sons Ltd., 1999.
- R2 Research papers from different journals & e-sources.
- R3 David F Ciambrone , Environmental Life Cycle Analysis, CRC Press LLC, 1997

5. Course Plan

Lecture No.	Learning Objectives	Topics to be covered	Reference
1	Introduction of sustainability concept and need of environmental management systems (EMS)	Introduction of environment, Sustainability concept	Ch.1 R1
2-3	Study the policy & legal aspects of environmental policies	Policies on environment	Ch. 1 TB
4-6	Study the government policies on environment in India	Environmental legislations in India	Ch. 2 TB
7-11	Different national & international regulations for air and water pollutants	Summary of Clean Air Act & Clean Water Regulations in India and U.S.	Ch. 2 TB
12-14	Study air permit and water permit procedures	Permit procedures	Ch. 3 TB
15-18	Study of ISO 14000 international environmental management standards. To discuss case study	Details of ISO 14001	Ch. 4 TB & R 2
19-20	Environmental audit and detailed procedure for conducting EA	Topics related to environmental audit	Ch. 5 TB & R 2
21-25	Life Cycle Assessment (ISO-14040 Framework), Inventory analysis, Interpretation of LCA	Topics related to LCA	Ch.6 TB & R2 & R3
26-28	Environmental Impact Assessment (EIA)	Topics related to EIA	Ch. 7 TB & R 2



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29-32	Environmental Economics	Environmental economics: Introduction to WTO and International Trade, Environmental Trade Barriers, Green GDP, Natural Resource Accounting, Green Accounting, Environmental Communication, GRI reports	R2
33-34	Forecasting environmental changes	Introduction to climate change, Modern climate change methodologies, Climate projections	R2
35-37	Risk assessment	Topics related to risk assessment, risk analysis in process industries,	Ch 8 (TB)
38 - 40	Solid & hazardous waste management	Techniques of waste minimization and management	Ch. 8 (TB)

6. Evaluation Scheme

Evaluation Component	Duration	Weightage (%)	Date & Time	Nature of Component
Mid semester test	90 min.	25	<TEST_1>	CB/OB
Project	-	15		-
Case studies discussion (two only)	-	10		-
Assignment on Umberto Nxt (LCA software)	-	10		-
Surprise class Test (2 best out of 3)	-	5		CB/OB
Comprehensive Examination	3 hrs	35	<TEST_C>-	CB/OB

- Chamber consultation hours will be announced in the class.
- The major notices will be uploaded on Nalanda and Chemical Engineering notice board.
- Make-up will be granted for genuine cases only. Prior permission of IC is compulsory.
- Students are expected to be creative and innovative in order to pace with the latest developments in the field of environment.

CHE G551
Instructor-in-Charge



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