SHIV NADAR UNIVERSITY

GRADUATE COURSE DESCRIPTION

I. **COURSE TITLE:** Industrial Environment Management

II. **COURSE CODE:** CED659

III. **COURSE CREDITS (L:T:P):** 3:1:0 (4 Credits)

IV. **TOTAL CONTACT HOURS/ BATCH/WEEK (L:T:P):** 3-1-0

V. **COURSE TYPE (MAJOR/UWE/CCC/REAL/VELS/IC), PLEASE MENTION ALL THAT APPLIES:** Core/Major or UWE

VI. **PREREQUISITE/S (IF ANY):** Not required

VII. **SCHOOL/ DEPARTMENT:** SoE/CIVIL ENGINEERING

VIII. **DISCIPLINES TO WHICH THE COURSE MAY BE OF INTEREST:** All Engineering disciplines

IX. **COURSE CONTENT:**

- CHAPTER 1: Introduction to environmental management in industries: Brief of industrial pollution, environmental engineering, environmental ethics, environmental impact assessment (EIA) for industrial projects, concerns of industrial pollution, major industrial project activities requiring prior environmental clearance, environmental acts and rules, introduction to water pollution and control, characterization of air pollution emissions.
- CHAPTER 2: Solid and hazardous wastes in industries: Sources and types of wastes, definitions, concepts and management aspects, exports, imports and commercial treatment of hazardous waste, management of hazardous waste and non-hazardous waste in industries, toxic transfers to treatment and disposal facilities, waste treatment and disposal, laws and rules for industrial wastes, case study for industrial waste management.
- CHAPTER 3: Water use and industrial wastewater: Industrial water requirements, parameters for assessment of water quality, deterioration of water quality, industrial water demand in the break of unit operation, water demand for different industries, measurement of water pollution parameters in waste water released from industrial treatment process, general standards for discharge of environmental pollutants, industry-based wastewater generation standards, recycle and reuse of industrial wastewater.
- CHAPTER 4: Control and removal of specific pollutants in industrial wastewaters: Unit processes and operations to remove oil and grease, cyanide, fluoride, toxic organics, heavy metals, radioactivity substances, some advanced technologies for removal of toxic contaminants from industrial wastewater.
- CHAPTER 5: Air quality monitoring in industries: Measurement methods of criteria air pollutants in industries, stack sampling at industrial chimneys, ambient and industrial air

quality standards, load based industrial standards, concentration-based standards, air quality management in industries, compliance of air quality legislations in industries.

- CHAPTER 6: Control of gaseous and particulate emissions, air quality management in industries: Control equipment including hood and ducts, tall stacks, electrostatic precipitator, scrubbers, thermal oxidizers and catalytic oxidizers, recent trends in industrial waste management, cradle to grave concept, life cycle analysis, clean technologies concept in industries.
- CHAPTER 7: Environmental impact assessment (EIA) of industrial projects: Definitions, methodology for procedure of EIA prior to project commencement of different industrial projects such as road project, hydroelectric power plant, thermal power plant, manufacturing industries and building projects.
- CHAPTER 8: Environmental audits in industries: Definitions and concepts, environmental audit versus accounts audit, internal audits, external audits, compliance audit, relevant methodologies, regulations, introduction to ISO and ISO 14000, difference between ISO 9000 and 14000, standard procedure to achieve ISO 14000.
- CHAPTER 9: Case studies on environmental management in industries: Brief ideas of unit operations and processes in industries for production, material flow diagrams, water requirements, wastewater generations, hazardous waste management, air quality management. The industries of consideration are dairy production plant, fertilizer manufacturing industry, distillery industry, cement production industry, pharmaceutical industry and sugar production industry.
- CHAPTER 10: Case studies on environmental management in industries: Similar contents of Chapter 9. However, the industries of consideration are pulp and paper industries, iron and steel production plant, metal plating industry, aluminum industry, textile industry and thermal power plant.

Field visit: A field visit to an industrial plant (thermal power plant or cement industry or pharmaceutical industry) in the NCR with good environmental management practice.

X. RECOMMENDED BOOK(S):

Reference Book:

(1) Bhaskar, N., Hens, L., Nath, B., Compton, P., & Devuyst, D. (Eds.). (1999). Environmental Management In Practice: Volume 2-Compartments, Stressors and Sectors. Taylor & Francis.
(2) Gupta, R. C. (2012). Energy and Environmental Management in Metallurgical Industries. PHI Learning Pvt. Ltd..
(3) Li, H., & Chen, Z. (2007). Environmental management in construction: a quantitative approach. Routledge.
(4) Lawrence, D. P. (2003). How to Make EIAs More Practical. Environmental Impact Assessment: Practical Solutions to Recurrent Problems, 209-265.
(5) Canter, L. W. (1996). Environmental impact assessment (No. Ed 2.). McGraw-Hill Inc.

In addition to above reference books, handouts, web references and lecture slides are considered as relevant reference materials for the students to study.

XI. ASSESSMENT SCHEME:

Grading Policy:

Mid-sem exam:	20
End-sem:	30
Quiz:	15
Assignment, attendance, class performance:	15
Mini-Project/Term paper:	20
Total:	**100**