III B.Tech II Semester

15ACE34-ENVIRONMENTAL ENGINEERING - II

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Course objectives

1. *To provide the adequate information on various disposal standards for industrial effluents*
2. *To study the information about air pollution and its effects*
3. *To understand the knowledge about solid waste generation and disposal methods*
4. *To impart knowledge on Environmental management and Environmental Impact Assessment*

UNIT – I

INTRODUCTIONTO AIR POLLUTION: Air Pollution – sources of pollution – Classification– effects on human beings, Plants and Materials – Global effects of Air pollution – ozone layer disturbance - Greenhouse effect – Ambient air quality and emission standards - Air pollution indices - Air (Prevention & Control)Act 1986.

UNIT – II

PARTICULATE POLLUTANT CONTROL: Settling chambers - Filtration – Electrostatic precipitation - Cyclone separation - Wet collectors - Design of various particle control devices - **GASEOUS POLLUTANT CONTROL:** Gas absorption in tray and packed towers - Absorption with/without chemical reaction - Adsorption in fixed beds - Wet scrubbers

BIOLOGICAL AIR POLLUTION CONTROL TECHNOLOGIES: Bioscrubers - Biofilters - Integrated air pollution control systems

UNIT –III

INDUSTRIAL WASTE TREATMENT : industrial waste treatment –Volume reduction – strength reduction – Neutralization – Equalization – Proportioning –Nitrification and Denitrification – Removal of Phosphates – Effluent standards.

UNIT – IV

SOLID WASTE MANAGEMENT: Solid waste Management – sources, composition and properties of solid waste – collection and handling – separation and processing.

SOLID WASTE DISPOSAL METHODS: Solid waste disposal methods – Land filling and composting – Incineration.

HAZARDOUS WASTE: Hazardous Waste – Nuclear waste – Biomedical wastes – chemical wastes – Effluent – disposal and Control methods.

UNIT – V

ENVIRONMENTAL IMPACT ASSEMENT(EIA): Definitions and concepts – rationale and historical development of EIA – EIA in Civil Engineering, Initial environmental examination – environmental impact statement – Terms of reference – environmental appraisal – environmental

impact factors and areas of consideration – measurement of environmental impact, organization – scope and methodologies of EIA – Check lists, Matrices, Networks – status of EIA in India.

Course outcomes:

- *Recognize the design philosophy of water and wastewater treatment processes;*
- *Determine appropriate treatment parameters involved in drinking water treatment and municipal wastewater treatment processes such as yield coefficients, BOD decay constant, aeration rate constant, etc.*
- *Apply the principles, procedures, and current code requirements to the analysis and design of water and wastewater treatment engineering systems.*
- *Apply pilot study techniques and laboratory analytical methods to analyze changes of water qualities of raw water and wastewater and to estimate efficiencies of the designed treatment engineering systems.*

TEXT BOOKS:

1. Environmental Science and Engineering by J.G.Henry and G.W.Heinke – Person Education.
2. Environmental Engineering and Management – Dr.SureshK.Dhameja– S.K.Kartarai& Sons 2nd Edition 2005.
3. Environmental Engineering by Basak, Tata Mc.Graw Hill Edition, NewDelhi.
4. Environmental Pollution Control Engineering by C.S Rao
5. Canter, R.L., "Environmental Impact Assessment", McGraw Hill Inc., New Delhi, 1996.
6. L. W. Canter, Environmental Impact Assessment, 2nd Ed., McGraw-Hill, 1997.
7. Shukla, S.K. and Srivastava, P.R., "Concepts in Environmental Impact Analysis", Common Wealth Publishers, New Delhi, 1992.

REFERENCES:

1. Solid Waste Engineering by PaarneVesilind, Willaiam, Cengage Publications, New Delhi.
2. Air Pollution and Control by MN Rao&H.N.Rao.
3. Environmental Engineering by Gerard Kiely, Tata Mc.Graw Hill Edition, New Delhi.
4. Air Quality by Thodgodish, Levis Publishers, Special India Edition, New Delhi.
5. Introduction to Environmental Engineering by Mackenzie.L.Davis, Devid.A.Cornwell, Tata Mc.Graw Hill Edition, New Delhi.
6. John G. Rau and David C Hooten "Environmental Impact Analysis Handbook", McGraw Hill Book Company, 1990.