

ENVIRONMENTAL ENGINEERING

Preamble:

This paper provides an overview of the basic concepts of environmental engineering. It covers various treatment technologies and their application to water and waste water, liquid and solid wastes, and gaseous materials and their management. Introduction to Engineering Fundamentals: Principles of environmental quality objectives, standards and guidelines; Environmental processes: Engineered systems and policies; Professional directions in environmental engineering; Material Balances and Separations. Science of environment: physical & chemical processes, Environmental Biology, Basics of Microbiology Treatment technology and control: Aerobic and anaerobic processes; aeration, coagulation and flocculation, sedimentation, filtration, disinfection. Tertiary treatment technologies.

Technological considerations and Engineering applications Water Treatment Processes; Water transmission, distribution, storage. Wastewater Flow rates & Collection; Wastewater Treatment Processes. Constructed wetlands. Air Pollution Control: Treatment of Emissions; Dispersion; Control of Moving Sources; Air Pollution control costs. Solid waste management: Characteristics and collection system. Separation, processing and conversion. Land filling. Future opportunities.

Hazardous Wastes: nuclear waste, biomedical waste, chemical waste. Hazardous waste management. Waste Minimization; Pollution Prevention and control strategies Practicals: Report on the visits to water treatment, waste water treatment and sewage treatment plants.

Report on the visits to Air pollution monitoring station; making flow sheets.

Viva-Voce based on the above reports.

Suggested Readings:

Henry Glya, J. and Heinke, 2004, Gary W. Environmental Science and Engineering. Pearson low priced edition.

Kiely, G., 1998, Environmental Engineering, Irwin McGraw Hill, Boston.

Masters, M.G., 1998, 2nd Edition, Introduction to Environmental Engineering and Science, Prentice Hall, London.

Peavy, H.S., Rowe, D.R. and George, T., 1987, Environmental Engineering, McGraw Hill, New York.

Vesilind, P.A., 1997, Introduction to Environmental Engineering. PWS publishing, Boston