

CIPE3003 ENVIRONMENTAL GEOTECHNICAL ENGINEERING (3-0-0)

Course Objectives:

1. To explore different sources of site contamination and their remedial measures
2. To understand basic principles of Solid and Hazardous Waste Management
3. To acquire knowledge regarding contaminant transport
4. To formulate strategies regarding management landfills and Ash Pond Dykes

Module-I: (08 Hrs)

Sources and Site Characterization: Scope of Environmental Geotechnics, Various Sources of Contaminations, Need for contaminated site characterization; and Characterization methods. Remediation Techniques: Objectives of site remediation, various active and passive methods, remediation NAPL sites, Emerging Remediation Technologies, Geosynthetics: Types, Functions and Design.

Module-II: (08 Hrs)

Solid and Hazardous Waste Management: Classification of waste, Characterization solid wastes, Environmental Concerns with waste, waste management strategies.

Module-III: (06 Hrs)

Contaminant Transport: Transport process, Mass-transfer process, Modeling, Bioremediation, Phytoremediation.

Module-IV: (8 Hrs)

Landfills: Types of landfills, Site Selection, Waste Containment Liners, Leachate collection system, Cover system, Gas collection system, Ash pond Dykes: Design

Course Outcomes:

After successfully studying this course, students will able to:

1. Suggest various remediation techniques for modification of contaminated sites
2. Determine the most appropriate technique for Solid and Hazardous Waste Management
3. Address the issues related to Contaminant Transport
4. Design landfills and Ash pond Dykes

Books:

- Phillip B. Bedient, Refai, H. S. & Newell C. J. - Ground Water Contamination - Prentice Hall Publications, 4th Edition, 2008
- Sharma, H. D. and Reddy, K. R. - Geoenvironmental Engineering, John Wiley & Sons (2004)
- Rowe, R. K. - Geotechnical & Geoenvironmental Engineering Handbook, Kluwer Academic, 2001.
- Reddi, L. N. and Inyang, H. I. - Geoenvironmental Engineering Principles and Applications, Marcel. Dekker, Inc., New York, 2000.
- LaGrega, M. D., Buckingham, P. L. and Evans, J. C. - Hazardous Waste Management, New York: McGraw-Hill, 2001