

<b>CECX18</b>	<b>ENVIRONMENTAL GEOTECHNOLOGY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>

**OBJECTIVES:**

To impart knowledge about the

- Environmental cycles, soil water interaction relating to geotechnical problems
- Site selection criteria for waste disposal and disposal methods
- Transport of contaminants and hydrological design for ground water pollution control
- Safe disposal techniques of hazardous waste and remediation of contaminated soil.

**MODULE I INTRODUCTION 7**

Introduction to Environmental Geo techniques-Environmental cycles and their interaction-Soil water environment interaction relating to geotechnical problems, Sources, production and classification of wastes. Environmental regulations in India

**MODULE II SITE SELECTION AND METHOD OF DISPOSAL 8**

Criteria for selection of sites for waste disposal facilities-parameters controlling the selection of wastes disposal sites-current practices for waste disposal, subsurface disposal techniques-Passive contaminant systems- Leachate contamination applications of geo membrane and other techniques in solid and liquid waste disposal-rigid or flexible membrane liners.

**MODULE III HYDROLOGY OF CONTAMINANTS 8**

Transport phenomena in saturated and partially saturated porous media contaminant migration and contaminant hydrology-Hydrological design for ground water pollution control-Ground water pollution downstream for landfills - pollution of aquifers by mining and liquid wastes-protection of aquifers.

**MODULE IV HAZARDOUS WASTE MANAGEMENT & REMEDIAL MEASURES 7**

Hazardous waste control and storage system-Stabilization - Processes and Environmentally safe disposal of solid and liquid wastes - Ground modification techniques in waste fill, Remedial measures for contaminated grounds - Remediation technology - Bio-remediation.

**Total Hours : 30**

**TEXT BOOKS:**

1. Fang, H.Y., Chaney, R.C., "Introduction to Environmental Geotechnology", Taylor and Francis, CRC Press, 2<sup>nd</sup> Edition, 2017.
2. Rowe, R.K., "Geotechnical and Geoenvironmental Engineering Handbook", Kluwer Academic Publications, London, 2000.
3. Hillel. D., "Introduction to Environmental soil physics", Academic press, New York, 2003.
4. Young, R.N., "Geoenvironmental Engineering contaminated soils, pollutants fate and Mitigation CRC press, New York, 2001.

**REFERENCES:**

1. Yong, R.N., Nakano, M., Pusch,R., "Environmental Soil Properties and Behaviour", Taylor and Francis, CRC Press, 2012.
2. Fetter, C. W., Boving, T., Kreamer, D., "Contaminant Hydrogeology", Waveland Press, USA, 3<sup>rd</sup> Edition, 2017.
3. Westlake, K., "Landfill Waste Pollution and Control", Woodhead Publishing India Private limited, 2013.

**OUTCOMES:**

At the end of the course, the students will be able to

- Identify the soil water interactions, the problems associated with the release of the wastes into soil water environment and Implement the various environmental regulations
- Select appropriate and safe sites and methods of disposal of wastes by analyzing the various parameters in the soil water environment
- Model the transport of contaminants in the soil water environment by the applying the principles of hydrology
- Apply the safe techniques of control and storage systems for hazardous waste and also suggest remediation techniques in soil water environment