

EN4106 Geo-Environmental Engineering

[Lecture: 26 hrs ; Tutorial: 13 hrs; Lab: 0 hr; Pre-requisite: CV2013; Academic Unit: 3]

Learning Objective :

To introduce the basics of geoenvironmental problems, contaminant transport in subsurface environments, containment and cleanup of contaminated sites.

Course Content :

Introduction to geoenvironmental problems, soil mineralogy, components of waste containment systems, contaminant release mechanisms, contaminant fate and transport in subsurface environments, remedial technologies and selection.

Course Outline :

S/N	Topic
1.	Introduction to geo-environmental problems
2.	Soil formation, phase composition, mineralogy, and characterization
3.	Geotechnical analysis
4.	Use of geosynthetics in geoenvironmental engineering
5.	Waste containment facilities, design of landfill liner and cover systems
6.	Contaminant fate and transport in subsurface environments
7.	Contaminant release mechanisms and exposure assessment
8.	Principles of site remediation technology selection
9.	Cleanup of contaminated soil and groundwater
10.	Special topics

Learning Outcome :

Students should be aware of the various geoenvironmental problems, their multi-disciplinary nature, site contamination scenarios and control.

Textbooks :

Reddi L.N. and Inyang H.I. (2000). Geoenvironmental Engineering: Principles and Applications. CRC Press.

References :

- Sharma H.D. and Reddy K.R. (2004). Geoenvironmental Engineering: Site Remediation, Waste Containment, and Emerging Waste Management Technologies. John Wiley and Sons.
- Course notes by course instructors.